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THE IRON AGE

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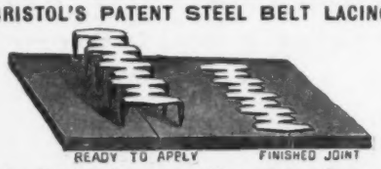

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SEE PAGE 29

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THE IRON AGE

New York, Thursday, September 2, 1909.

THE MANUFACTURE OF TIN CANS.

Machinery and Processes Developed by the Sherwin-Williams Company.

BY H. M. LANE.

It is not a new thing for large manufacturers to make their own supply of various articles which they use in large quantities, and following out this idea the Sherwin-Williams Company, Cleveland, Ohio, has a number of factories for supplying partly finished or finished products required in its business. The tin can department is of particular interest, as in connection with it have been designed a number of machines which are now patented and are used extensively by other manufacturers, for some of this tin can machinery is made and sold by the Sherwin-Williams Company. The receptacles used are of two varieties, which are really cans and pails. This article will deal only with the round cans and pails, as it is in their production that most of the special machinery is used.

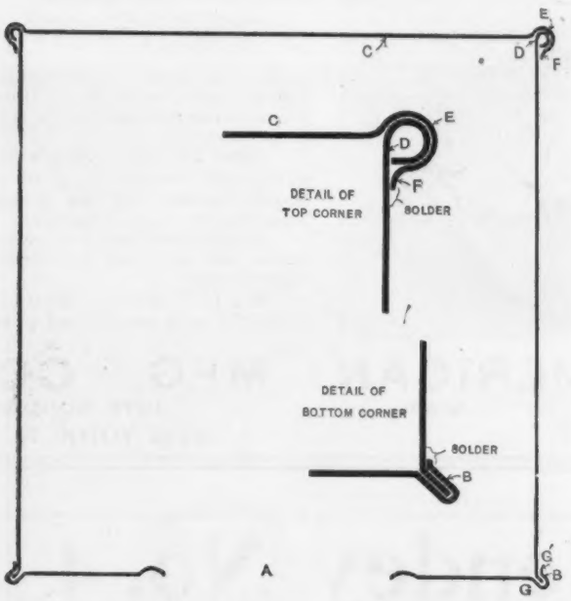


Fig. 1.—Section of Gallon and Half-Gallon Paint Pail.

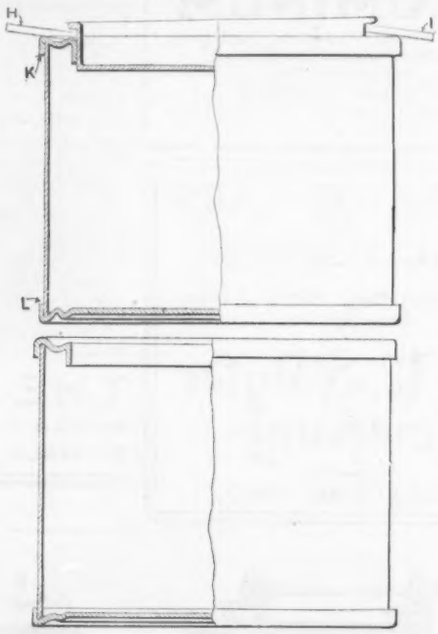


Fig. 2.—Section of "Penny Lever" Can.
Fig. 2a.—Same Can Before Crimping.

For half-gallon and gallon sizes a pail is used, a half section of which is shown in Fig. 1. When this is made an opening is left in the center of the bottom at A, through which the material is introduced, and this is subsequently soldered up with a small cap. In order to give strength the sheet comprising the bottom is turned over the edge of the side, as shown at B. The top of the pail C is made of thin tin, which is subsequently cut out by the painter, the knife cut being made close to the rim. In order to strengthen the top of the pail so as to form a good bucket for carrying paint the side is turned over to form a false wire, as shown at D. The top is then formed over this false wire, as at E. The edge of the top is bent past the wire and flattened against the side of the can, as at F.

The soldering for the top consists in simply flowing solder along the line between the flat portion of the top at F and the side of the can, while for soldering the bottom the solder is flowed into the corner at G, so as to unite the portion of the bottom which has been forced back over the edge and the side of the can. This construction gives the pail three thicknesses of tin at the bottom to form a rigid support for it to stand upon, and after the top has been cut out there is a double thickness of false wire around the upper edge to stiffen the pail.

The cans for less than half gallons are made as shown in Fig. 2. The lid is simply pressed into the top of the can after the contents have been introduced, and forms its own seal. This is known as the "penny lever" can, from the fact that a cent slipped under the edge, as at H, may be used to pry loose or start the cover in removing it from the can, as shown at I. The intention was to make the opening of the can the simplest possible so that there might be no necessity of hunting for some special tool.

In making the cans the first operation is to roll the tin so that it can be side seamed. It is cut out to the required width and length, in flat sheets, as shown at M, Fig. 3. These flat sheets are fed through a pair of small bending rolls, which appear in the upper right hand corner of Fig. 3. The bent tin falls into the bin at the back of Fig. 3, or in some cases is fed through chutes to several bins to supply groups of machines for making different sizes of cans from one pair of bending rolls. After the tin has been bent the can is soldered along the side seam by means of a special machine developed and patented by Frederic W. Ballard, mechanical engineer for the Sherwin-Williams Company. It is shown in Fig. 3 and in greater detail in Fig. 4. The can is first placed on a special horn at the front of the machine and secured by means of the clamping devices upon the machine. The horn with the can clamped in place is then run under the soldering iron by means of a foot lever connected with a chain, which can be seen in Fig. 3. The solder reels at the back of the machine, shown in Figs. 3, 4 and 5, contain the stock of solder in wire form. A

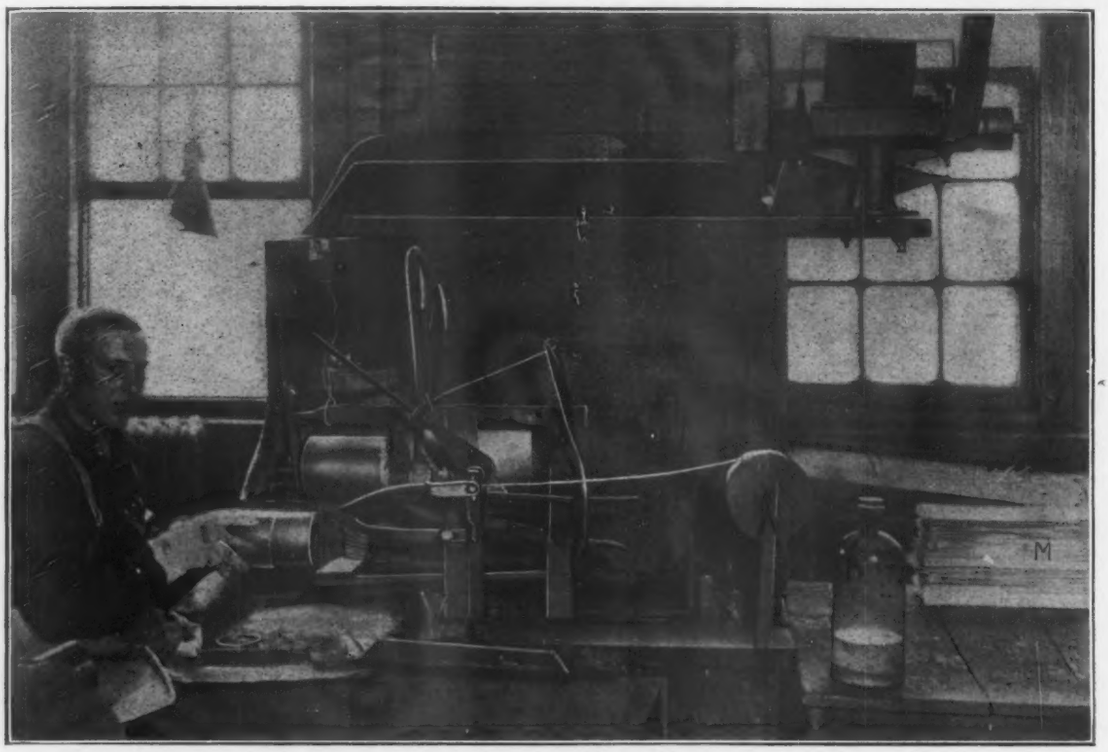


Fig. 3.—Side Seaming Machine to Which Cans Are Delivered from Bending Rolls.

ratchet wheel which can be set to feed any desired amount is arranged to control the solder rolls, and feeds the proper amount of solder wire forward through the

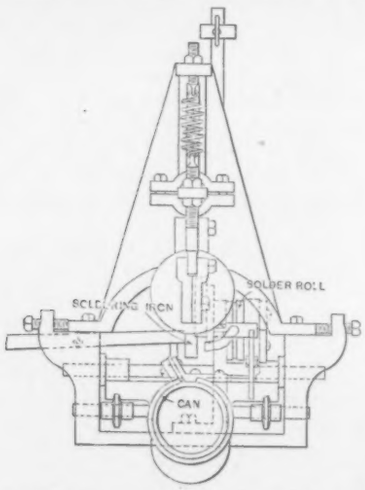


Fig. 5.—End Elevation of Side Seaming Machine.

guide tube against the soldering iron, causing it to flow down along the seam. The can is moved backward and forward by means of the treadle while the soldering iron

Fig. 6.—Press for False Wiring Paint Pails.

is in contact with it. The soldering iron is arranged in a firepot fired with gas, and in this machine and all other mechanical soldering appliances used at the Sherwin-Williams Company the soldering iron is made of

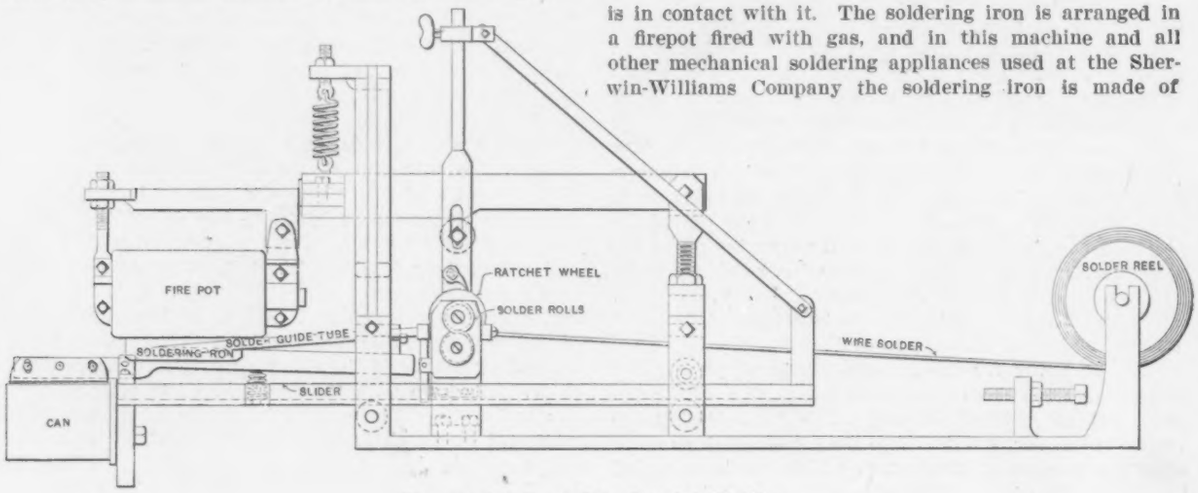


Fig. 4.—Details of Side Seaming Machine.

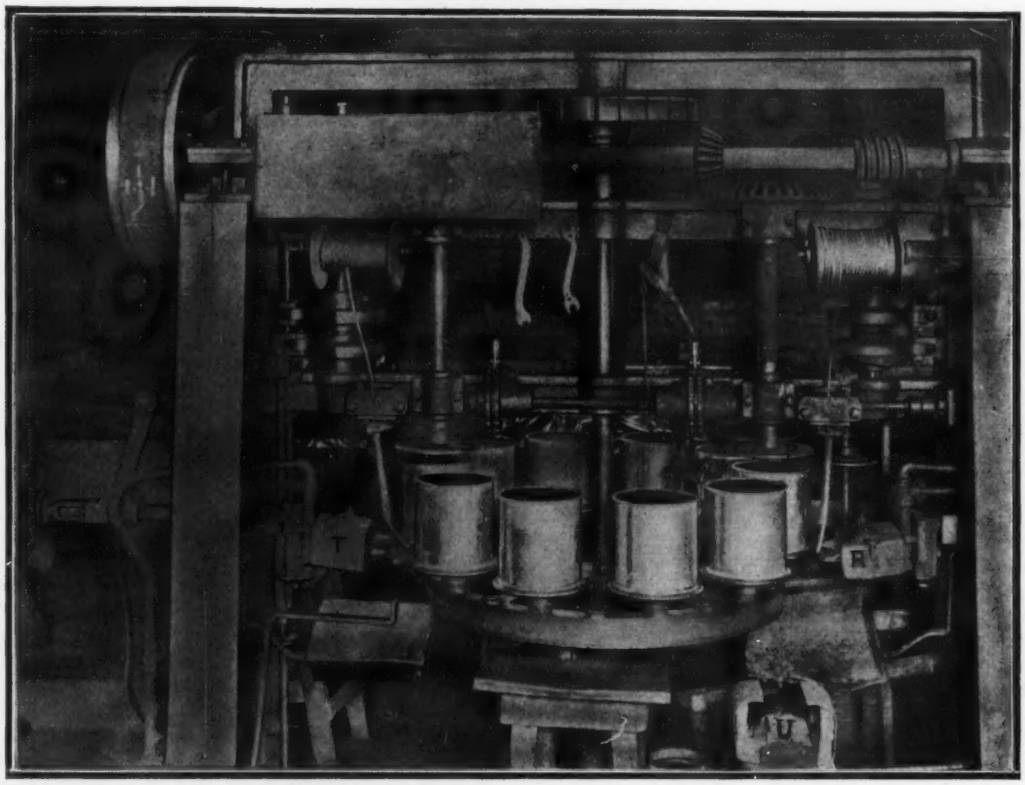


Fig. 7.—Can and Pail Soldering Machine.

low grade steel and not of copper. What hand soldering is necessary at the plant is done with ordinary coppers.

These soldering machines have been sold to other concerns for soldering the cases for dry batteries and many other purposes. They make it possible to side seam cans very rapidly. After the side seaming operation the cans pass direct to the machine for soldering on the ends, while the pails have to be passed to machines for forming the false wire. The cans when they pass to the machine have the tops and bottoms placed on them loosely, as shown in Fig. 2a, and the machine crimps the seams into the form shown at K and L, Fig. 2. This operation will be described later in connection with the operations of the can soldering machine.

The false wire on the pails is formed by special dies in the press, shown in Fig. 6. In the background of this same illustration can be seen the solder wire reel of the side seamer referred to above. The bending rolls for this group of machines are situated on an elevated platform behind the wiring press. The bent stock from these rolls is fed through chutes to the different bins. The pails after side seaming are fed through a chute to the press which forms the false wire, and after false wiring are made to roll through another chute to the soldering machine.

A view of the soldering machine for the gallon pails, also patented by Mr. Ballard, is shown in Fig. 7. On account of the fact that fluxing acid has to be used on all of these machines much of the frame rusts quite rapidly, but this does not in any way interfere with

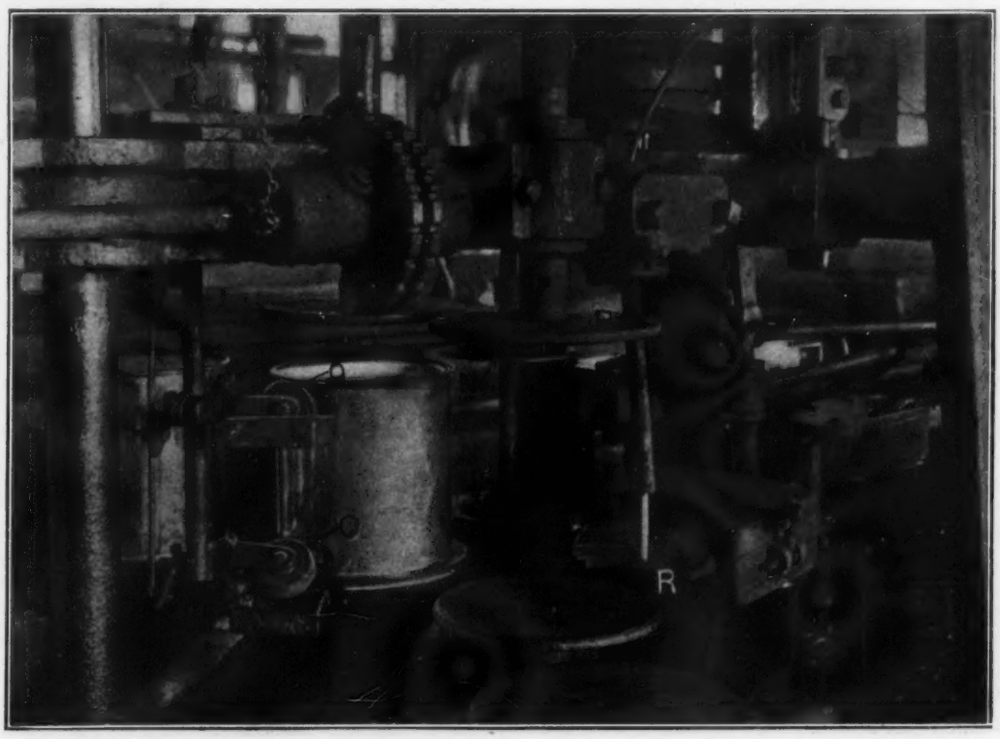


Fig. 8.—Crimping and Soldering Mechanism.

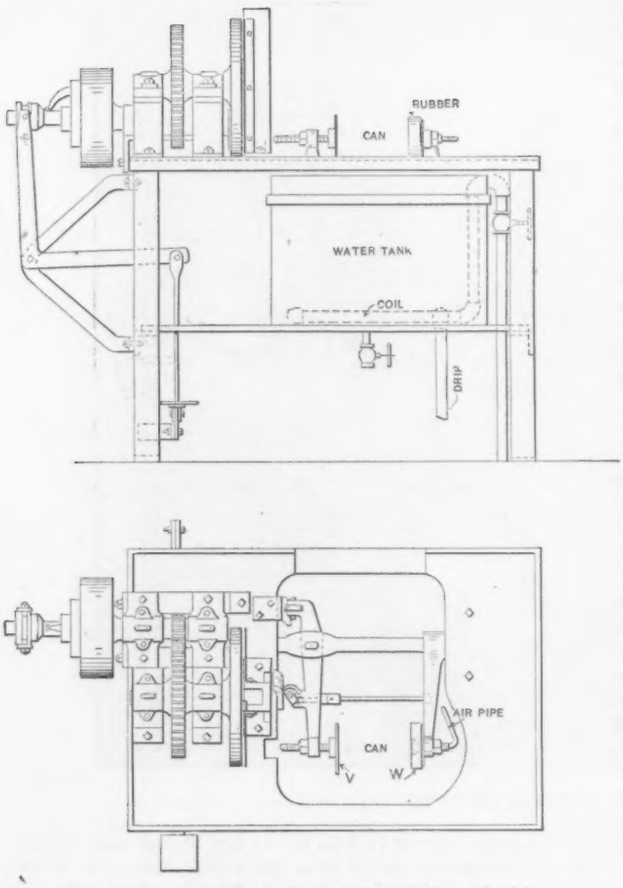


Fig. 9.—Plan and Elevation of Can Testing Machine.

their operation. The cans are placed on the machine at the back, as seen in Fig. 7. The machine first clamps the top and bottom firmly in position and crimps over both. The parts for doing this work are shown more clearly in Fig. 8. In this case the end clamp has not as yet descended upon the pail. On its descent the top and bottom plates supporting the pail immediately begin to revolve, and the two crimping rolls N, seen in the background to the right of the pail, come in contact with the edges of the top and bottom and crimp them down against the sides. At the same time the two small felt rollers O O, shown at the left of the can, are thrown up against the seam and flux it, the small boxes in which the rollers run being kept supplied with fluxing material. The top clamp over the can recedes automatically after the crimping and the machine moves forward one step. Then the top clamp, shown at P, Figs. 7 and 8, comes in contact with the top of the can and sets it rotating once more. Simultaneously the solder feeding mechanism feeds the proper amount of solder wire down against the soldering iron, which advances in contact with the side of the can at the seam. The soldering iron is clearly shown at R, Figs. 7 and 8. This operation solders one end of the cans.

As the machine moves forward a boy sitting in front turns the cans over so that when they come under the driving disc S, Fig. 7, they are ready to have the other end soldered. The moment this driving disc comes in contact with the can it sets it in rotation and at the same time the soldering iron G advances into contact with the can and the proper amount of solder wire for the joint is fed down. The cans are then removed by an operator sitting on the far side of the machine, as shown in Fig. 7. The boy who sits on the front side of the machine does not have as much work as the operator on the back, as the latter has to place the two ends on the can before putting it on the machine. This gives the operator on the front of the machine ample time to solder up by hand any defects that may be discovered in the subsequent testing, as they are comparatively few in number. A small heating furnace is arranged at U, Fig. 7, for heating an ordinary soldering copper with which defects can be remedied.

With the use of this machine it is possible to economize very greatly in the amount of solder required for a joint. In the old method of soldering cans by rolling the joint in the solder the solder extended on both the inside and outside of the joint, from the point G to the point G′, Fig. 1, and, in fact, it had to extend up the sides and along the bottom of the can about ⅛ in. With the arrangement used in connection with the Ballard can soldering machine the solder is simply flowed in a narrow line along the joint itself. The only solder that can do any possible good is that along the joint G, Fig.

Fig. 10.—Bail Soldering Machine.

1, and hence any extra solder used is only wasted. The Ballard machine used only about 30 per cent. of the solder required in the old style machines when they were run without wipers; when they are run with solder wipers their consumption is still such that the Ballard machine will make a saving of more than 40 per cent.

After the cans leave the soldering machine they are tested by the automatic device shown in two views in Fig. 9. The can is clamped between two plates, V and W, and automatically dipped into a tank of water. At the same time air pressure is turned on through the rubber clamping end and enters the open top of the can. If there are any leaks bubbles can be seen rising in the water tank. In this case the tester marks the leak with chalk and passes the can through a chute to the operator at the soldering machine, who does the repairing by hand. Most of the cans, however, are found perfect, and are immediately passed through a chute over the testing machine, through which they roll to the bailing machines, in the case of pails, while in the case of cans they are taken from the chute, washed to remove any flux, and passed to storage.

The machine for soldering bails on the pails is shown in Fig. 10. This is also automatic in its operation, so far as the solder feed, fluxing, &c., are concerned. The pail is placed in position, as shown in the machine, the bail slipped over it and the machine started by a trip lever controlled by the foot of the operator. Immediately the fluxing wipers come forward and flux both sides of the bail, after which the soldering iron shown at Y descends over the bail and the solder feed mechanism feeds the proper amount of solder against the soldering iron on each side. The pail is then reversed and the same operation carried out on the opposite side. After the bails have been soldered on the pails are washed by another operator and then dropped through a chute to the storage room below.

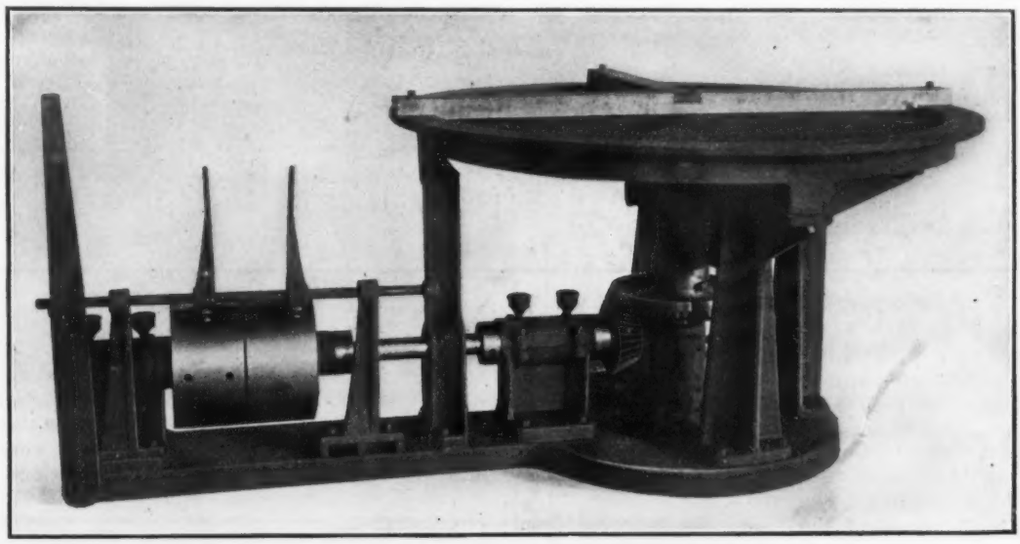
As this article is concerned mainly with the soldering operations, no attempt has been made to follow the various press and punch operations necessary for making the tops and bottoms, the ears for the bails, or for cutting and bending the wire stock for the bails themselves. These operations are conducted in ordinary punch presses, with which the readers of *The Iron Age* are familiar.

Charles W. Toepfer announces that he will continue at the same address the business in bar and sheet steel heretofore conducted by the late George M. Hogan at 417 Commerce street, Philadelphia, Pa. Mr. Toepfer was manager for Mr. Hogan for a long period of years, which is an assurance that he will furnish the same brands and qualities of material.

A Besly Horizontal Disk Grinder.

For grinding large surfaces, such as fire doors, door jambs of furnaces, stove doors, &c., and for grinding large gear case covers of automobiles, Charles H. Besly & Co., 15 South Clinton street, Chicago, Ill., have brought out the machine herewith illustrated, the Besly No. 19 48-in. horizontal disk grinder. The disk wheel is 48 in. in diameter, ¾ in. thick between ribs, 2½ in. at the center hub and 1½ in. at the rim, and has eight longitudinal ribs, ⅝ in. thick, radiating from the hub to the outer rim. On its working face the disk has spiral grooves and it has a 2-in. hole in the center. The wheel is secured to the spindle by four ¾-in. screws. The machine is equipped with a guard ring, which is raised about ¾ in. above the face of the disk wheel, and prevents the work from flying off the disk wheel while being ground. This ring has the top surface machined off true with the face of the disk wheel, so that bars, jigs, &c., can be secured thereto for holding the work.

The grinder is driven by an 8-in. belt running on a 12-in. diameter by 8¼-in. face pulley, and this pulley is secured to a shaft 2 in. in diameter by 51 in. long. On the inner end of this shaft is secured a 7-in. diameter, 2¾-in. face, four-pitch bevel pinion, which meshes into a 14-in. diameter, 2¾-in. face, four-pitch bevel gear secured to the spindle. The gears have planed teeth, and all pulleys and gears are keyed and held in place by set screws operating directly on keys. The loose pulley is 12 in. in diameter by 8¼ in. face, has its bearing on the shaft, and is oiled through the hub from a compression grease cup.



The No. 19 48-In. Horizontal Disk Grinder Built by Charles H. Besly & Co., Chicago, Ill.

The machine can be driven direct from the line shaft, or from the floor beneath, or from a countershaft, as may be desired. The speed of the driving shaft is 800 rev. per min. and the speed of the disk wheel 400 rev. per min. The spindle is 29½ in. long over all and is 3 in. in diameter in the bearings and 6 in. in diameter at the wheel collar and has a pilot 2 in. in diameter for holding and centering the disk wheel. The thrust is taken between two hardened tool steel blocks, one of which is secured to the lower end of the spindle and rotates with it, while the other is secured to the bed plate. The company has given particular attention to the lubricating of these thrust blocks and the bearings. The spindle bearings are 3 in. in diameter and each 9 in. long. The drive shaft bearings are 2 in. in diameter by 9 in. long. These bearing are all of split type, babbitted and reamed and the shafts are carefully fitted to them. The press for setting up the disk wheel is made in four parts or quadrants, and each quadrant has two handles. All screws are United States standard, and wherever subjected to wear are case hardened. The weight of the machine complete is 2400 lb., net.

LE BLOND HEAVY DUTY LATHES.

The heavy duty engine lathe illustrated is representative of a line of 16, 20, 24 and 30 in. lathes recently placed on the market by the R. K. LeBlond Machine Tool Company, Cincinnati, Ohio. These lathes have been designed each for a specified performance—*i. e.*, to take a given cut and remove a given number of cubic inches of metal per minute as a maximum. The 20-in. lathe, for example, that shown in Fig. 1, is capable of taking a cut ¼ in. deep by 1-6 in. feed, at the rate of 65 feet per minute, on 0.50 per cent. carbon spindle steel, which amounts to the removing of 32 cu. in. of metal per minute. There are many new features in the construction of this lathe, which, though not radical departures, tend to increase its producing capacity. It has been the aim to produce a tool without complications, easy to manipulate, of great ridigity and capable of transmitting a large amount of power.

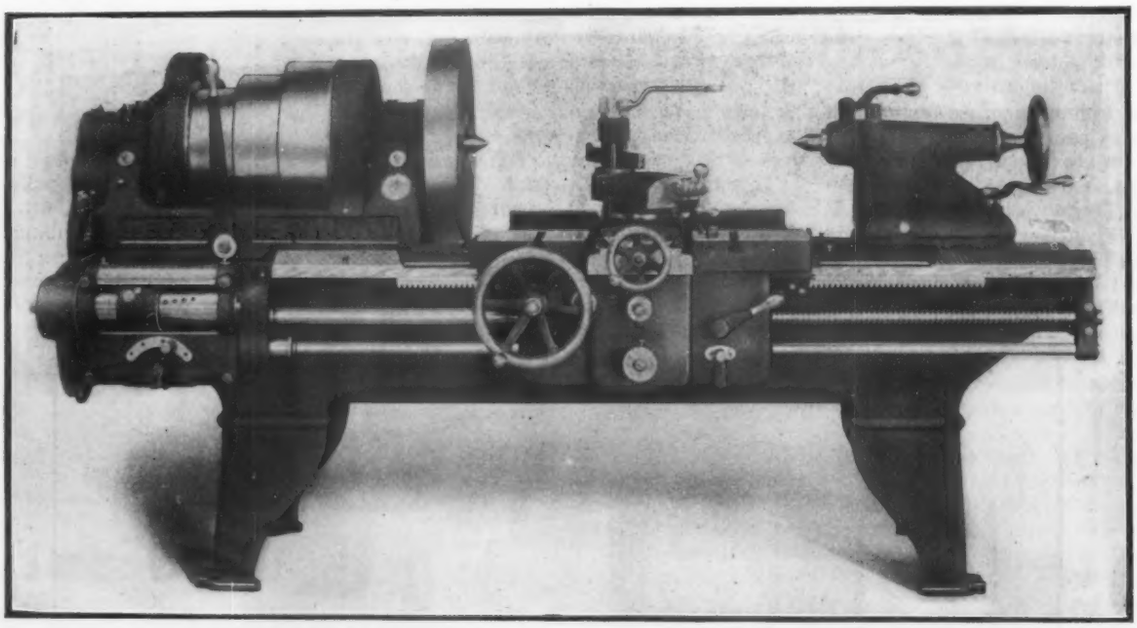


Fig. 1.—The New 20-In. Heavy Duty Engine Lathe Built by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio.

The headstock is of the company's improved drop braced pattern, extremely rigid and securely fastened to the bed with bolts of large diameter. The three-section cone in conjunction with the LeBlond double friction back gears and two-speed countershaft gives 18 changes of spindle speed covering a carefully selected range. The hollow spindle, which is made of high carbon hammered steel, has hardened and ground front and rear journals. These journals are carried in special cast iron boxes which are scraped to a bearing. This type of bearing does not require intricate oiling devices with continual attention from the operator, but the lubrication is nevertheless well taken care of. The bearing pedestals are cored out to form large oil chambers, which are filled from the front of the lathe and from which the oil is fed to the bearings by felt pads. This construction excludes possibility of grit entering the bearing and reduces the attention required to a weekly filling of the oil receptacles.

Fig. 2, which is an end and top view of the lathe, shows a new form of bed. The tailstock slides on a V of the usual proportions, on the rear way and on a flat surface in front. The carriage travels on a flat surface on the back and is held down at that point by a flat gib. The front of the carriage slides on a guide, however, of different shape than that usually found on engine lathes. This guide, or V as it may be called, is machined at an angle of 15 degrees on the front side and 70 degrees back angle. It is well known that the force exerted downward on the carriage of an engine lathe is many times the outward pressure, and in designing this bed the wearing surfaces have been proportioned accordingly. The bed, in addition to having an unusually deep section, is reinforced and braced by a transverse rib of I-beam section, directly under the front bearing, which rib extends to the extreme top of the bed. In addition to this the metal around the holding down bolts has been reinforced to about three times the thickness usually found at this point.

The carriage is extremely rigid and is carefully scraped to a bearing its entire length on the bed. It is held in perfect alignment by taper gibs on either end bearing on a scraped surface at the front of the bed, which construction, together with the 70-degree back angle on the V, overcomes any tendency of the carriage to climb the ways when engaged on heavy work. These gibs are tongued in position on the carriage and, to-

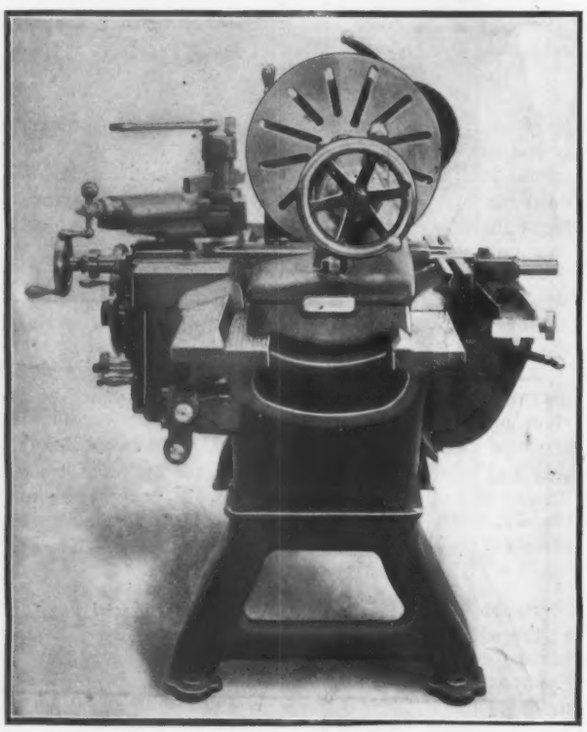


Fig. 2.—A Right End View of the Lathe.

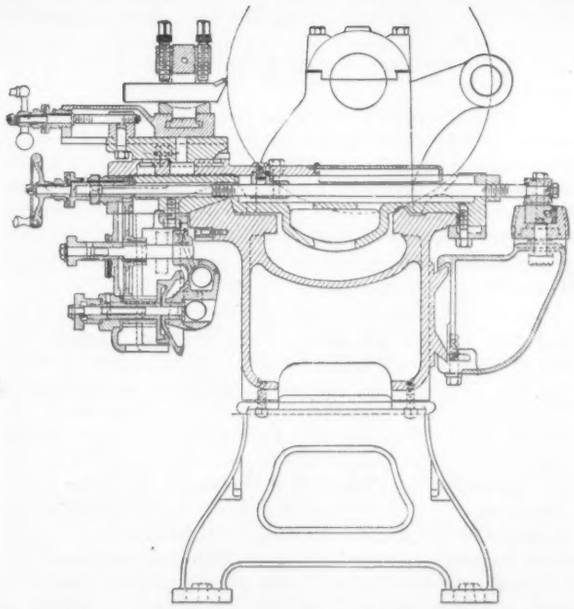


Fig. 3.—Cross Section Through the Bed, Carriage, Apron and Taper Attachment.

gether with the above mentioned form of V, form a construction that automatically compensates for wear, which makes it unnecessary to give any attention to the adjustment of these gibs. Wipers are provided, fitted with felt pads, which in addition to wiping off any grit on the sliding surfaces also automatically oil them.

Fig. 3, which is a cross section through the bed, carriage, apron and taper attachment, shows very clearly the proportions of the shears and also the position of the lathe spindle in relation to the bed. The spindle, as will be noted, is set back a considerable distance from the center of the shears, which not only gives an increased swing over the carriage, but permits the machine to be used at full swing without the tool overhanging the bed, a construction which gives great rigidity on work of large diameters.

Figs. 4 and 5 show front and rear views of the apron, from which it will be seen that this is a one-piece box section casting, with all gears and studs supported at both ends. Fig. 6 is a top view of this apron, which clearly shows the wide bearing by which it is attached to the carriage. The tongue is accurately fitted to the carriage and the apron is rigidly held in position by four bolts of large diameter. This single box section form of apron, it is claimed, does away with the necessity of an auxiliary support at the lower end of the apron and overcomes the difficulty of uneven wear between such lower slides and the V on the top of the bed. The longitudinal and cross feeds are operated by a single friction, which in addition to being of large diameter is so placed with respect to the gearing that it has but a light duty to perform. The feeds are engaged in this apron by an in-and-out movement of the knob shown on the front. This moving member has a central position, which disconnects all the gearing when the lathe is used for screw cutting. The apron is further provided with a device which makes it impossible to engage the feed rod and lead screw at the same time.

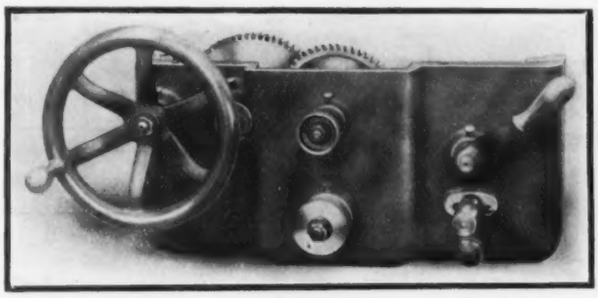


Fig. 4.—Front View of the Apron.

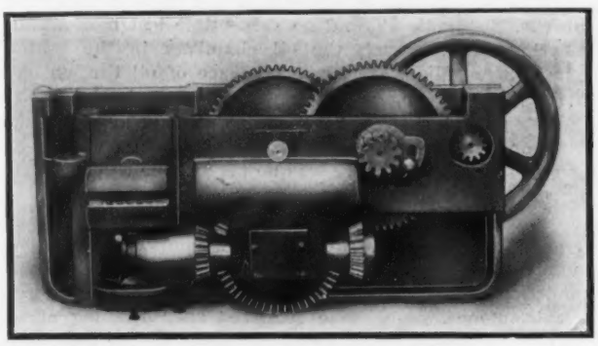


Fig. 5.—Rear View of the Apron.

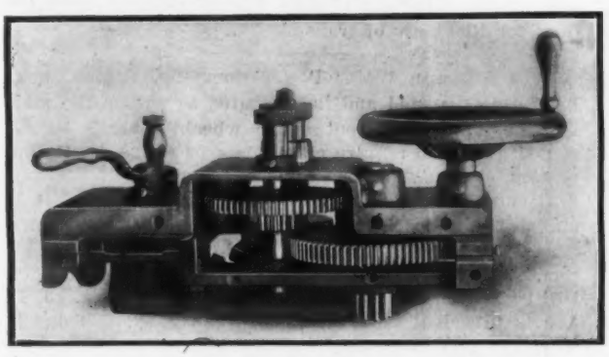


Fig. 6.—Top View of the Apron.

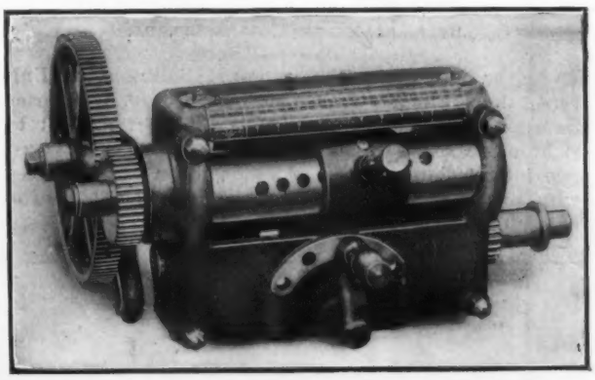


Fig. 7.—Front View of the Quick Change Gear Box.

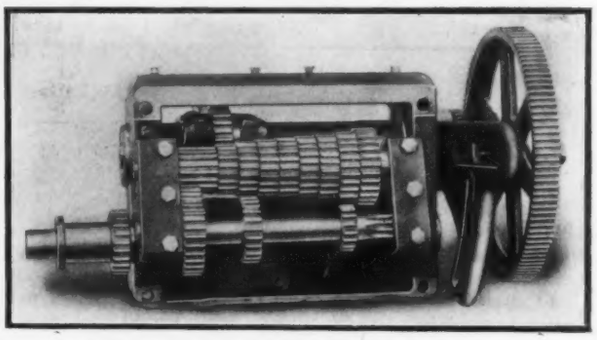


Fig. 8.—Rear View of the Quick Change Gear Box.

The tailstock is massive, with a bearing of ample length on the bed, and is rigidly clamped to the bed by two large clamping bolts centrally located between the shears. The tail spindle barrel is designed to give the maximum length of bearing and long travel. Suitable screws are provided for setting over for taper work, the base being graduated so that this setting can be easily accomplished.

The quick change gear box supplied with these lathes, as shown in Figs. 7 and 8, is worthy of notice, as it is the only device of its kind in which the entire mechanism is contained in one unit. Nine changes of speed are obtained through a cone of gears and the tumbler. It will be noted that this tumbler gear is supported on a large cylindrical bearing and is securely locked in position by

the plunger in the change handle. This construction has been a familiar feature of LeBlond lathes for some time. The nine changes noted above are quadrupled by the addition of the sliding gear transmission, which is well illustrated in Fig. 8, the gears being operated by the lower lever shown in Fig. 7. This construction permits the use of a direct reading index plate, shown in Fig. 7, from which the operator can read the position of the levers instantly. The 36 changes of threads, ranging from 2 to 30, are all made while the lathe is running under the heaviest cut. The gears in this box, as well as all other feed gears, are made from drop forged steel. The feed rod is driven by the same mechanism, suitable gears connecting it with the lead screws, giving a feed range from 8 to 120. The feed box is connected to the spindle by gears, the intermediate one of which is mounted on a quadrant, which permits the use of special or compound gearing at this point to cut special threads or metric threads with the United States standard lead screw or *vice versa*.

Right Angle Line Shaft Transmission.

BY B. FRANK TEAL, GLENSIDE, PA.

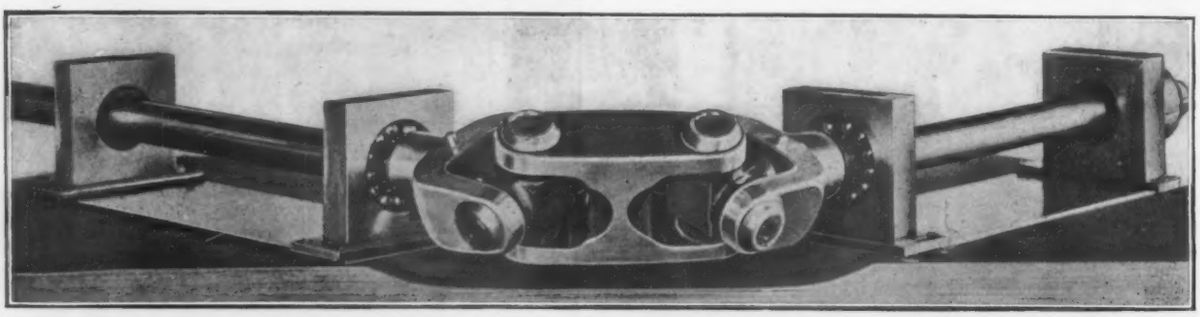
In the article on "An Improved Ball Bearing Universal Joint," in *The Iron Age* of August 19, 1909, brief reference was made to the application of this joint to right angle shaft transmission, and the sketch showed two intermediate links, each at an angle of 30 degrees with their respective shafts and with each other. The object of using two links was that the angle of each should not exceed 30 degrees, which was the limit of angularity at which the joint had been previously tested. Incidentally, it may be mentioned that an error occurred in the hastily made drawing; the yokes on the two shafts should have been shown with the jaws parallel, instead of at right angles. This would require one of the links to have parallel jaws, as otherwise the irregularity of motion caused by the oscillation of the center blocks would be transmitted to the driven shaft.

Those familiar with the subject of power transmission, know of many various devices which have been unsuccessfully tried to replace the miter gear drive, at one time universally used on quarter turn shafts, and it appeared to the writer that the solution of the problem required the elimination of all elements not absolutely essential to the highest efficiency and the use of an apparently prohibitive angularity. To attain this by reducing the number of intermediate links from 2 to 1 would necessitate an angularity of 45 degrees, and this appeared rather bold as applied to a line shaft required to fulfill ordinary everyday conditions. As an actual working test was the only means of solving this problem, the device shown in the accompanying engraving was made and subjected to a series of severe tests, the results of which will be later referred to.

Reduced to its elements, it will be seen that the device is composed simply of two pairs of universal joints; the connecting link constituting the two parallel yokes; formed, however, of a single piece, instead of having a shaft interposed. This old and well-known arrangement—known as Dr. Stook's angular shaft coupling—may be regarded as merely a mechanical movement as the great friction, due to ordinary journal bearings, renders it inapplicable to power transmission. By the use of the ball bearing trunnions, however, this difficulty, to a certain extent, would be overcome; the only question being as to its efficiency at the extreme angle of 45 degrees.

It will be understood, of course, that in all details of design and proportion, the joints for this device are the same as in those for ordinary purposes; and the ball bearing shaft journals, though not an essential feature of the combination, were used to reduce shaft friction as nearly as possible to the minimum, and thus render it a negligible quantity, so that all running friction might be chargeable to the device itself.

After an extensive experience in the use of ball bearings for various purposes in engineering construction, and a consequently well founded belief in their capabilities, the writer must confess to surprise at the results of the repeated tests to which this device was subjected. Power was applied by belt on the small pulley seen on the outer end of the right hand shaft. The pulley was twice the diameter of the shaft; and the belt—very light and slack—was of a width but four-fifths the diameter of the shaft. Starting with what would appear to be an extreme speed of about 1000 rev. per min., after a run of considerable duration the speed was gradually increased—without any change whatever in the belt or its tension, or in the driven pulley—until 7000 revolutions, at which speed many runs of considerable duration were made. As a matter of curiosity, but without much expectation of satisfactory result, the same belt was shifted from the pulley and run directly on the body of the shaft; of course, with more tension than previously, and the surprising speed of 14,000 revolutions was reached without any difficulty whatever.



Teal Universal Joints Applied in a Right Angle Transmission.

After all of this severe strain, due to such excessive speeds, the joints showed no perceptible lost motion; no heating; and, though the oil chambers in the center blocks were filled, there was no trace of oil thrown out from the self-oiling trunnion bearings past the felt packing rings, and, though there was no attempt at balancing for rotative speed beyond accurate work in finishing to symmetrical design there was no perceptible tremor, even at the highest speed.

While no dynamometer tests were made, and no quantitative results obtained beyond the matter of rotative speeds, the strains due to the latter, and the enormous multiplication of friction had it existed to any appreciable amount, would have rendered such running absolutely impossible. And no better proof of the efficiency of the device is needed than the fact that the tests were so far in excess of any possible requirements in every day duty for this class of transmission.

The Atkinson Water Power Company, Benton, Ark., has been organized and incorporated to put on the market the Atkinson patent water wheel. This is so designed as not to require either dam or sluice for its operation, the only power required being that of the natural current of the stream in which it is placed. It is stated to be specially suitable for large rivers which cannot be dammed, and will not interfere with navigation. The company is now having a wheel built which will be installed in the Saline River, near Benton. J. F. Lee is president of the company and J. R. Gibbons is secretary and treasurer.

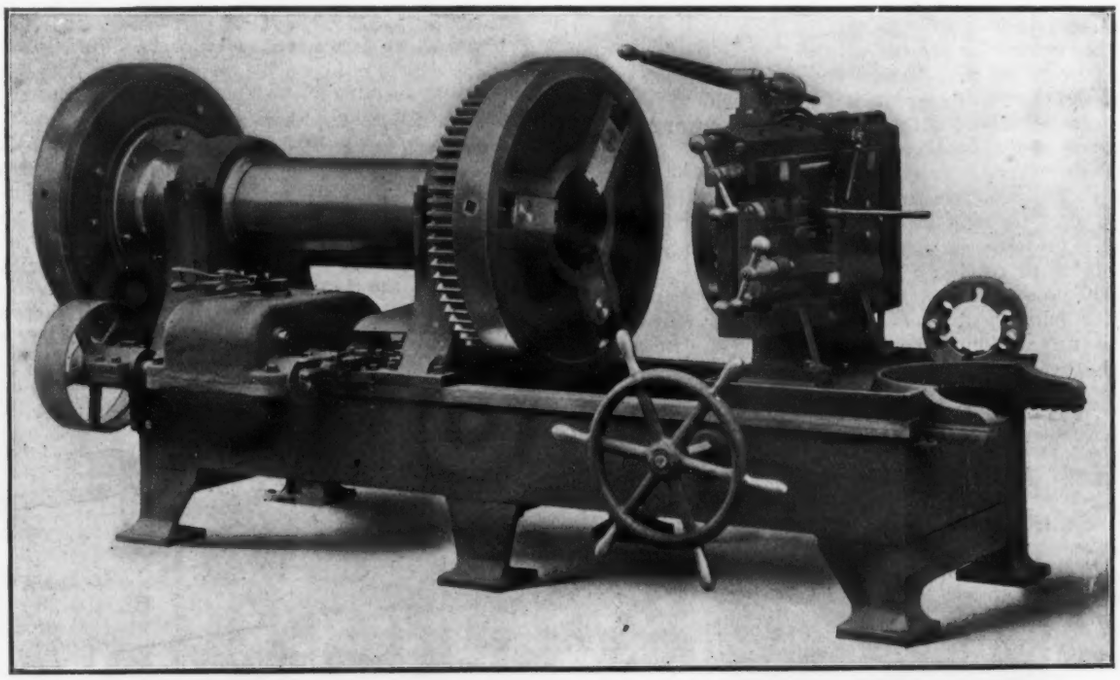
An Improved Bignall & Keeler Pipe Machine.

A new product of the Bignall & Keeler Mfg. Company, Edwardsville, Ill., is the No. 8 duplex improved pipe threading and cutting off machine, equipped with gear box drive, which will cut off and thread pipe or casing from 2½ to 8 in. diameter, inclusive. It is claimed that the design is such as to insure strength, stability and durability, and that it will withstand the severest strains of making up fittings, which requires more power and is harder on a machine than the cutting of threads.

The die head is of low-down type, placing the handles and die lever within easy reach of the operator, and is equipped with the Peerless adjusting mechanism, which is simple to operate. The adjustments necessary to obtain threads of different gauges are made by turning the adjusting nut, which is attached to the cam ring bracket by a swivel yoke. The adjusting screw passes through the nut and is connected to the die lever. Turning the nut in either direction revolves the cam ring, causing the dies to expand or contract. When the die lever is down, in position for threading, it is in a straight line with the adjustable screw, which means that the dies release with the first upward movement of the die lever, so that there can be no digging into the pipe. When the dies are to be removed from the head the stop latch is thrown back, allowing the cam ring to revolve into such a position that the openings in the ring are opposite the slots in the die head, and then the dies can be removed. This also permits the slots to be cleaned without removing the ring. The steady slides, which support the pipe when being cut off, have interchangeable hardened steel facings. On one of the sides is attached the cutting-off device, which places the cutting-off tool near the point of support. When it is desired to cut off pipe the steady slides are closed on the pipe firmly and the cut-off tool is then brought into action. The reaming tool is held in a tool post on the cut-off slide, and is always in position.

The chucks are of the independent type, each having three jaws. Tempered steel grippers are dovetailed into the ends of the slides, and can be removed and sharpened. The slides, which are made of steel, are graduated and readily set to any particular size. The slides on the rear chuck have flange grippers in addition to pipe grippers, for making up flanged work. Different speeds are obtained through the gear box and a compound sliding gear on one of the shafts. There are no rocking gears or clutches. The gears in the box are of steel and run in oil. A speed plate is attached to the box, indicating the speeds for the various sizes of pipe. By using a single driving pulley a constant belt speed is obtained. The oil pump supplies oil to the dies and cutting-off tool and is directly connected and not driven by belt, which latter gives trouble from becoming saturated with oil.

The countershaft has two self-oiling loose pulleys for open and cross belt, one tight and one driving pulley. The regular equipment of the machine consists of one set each of right hand pipe dies, from 2½ to 8 in., inclusive, countershaft and wrenches. The specifications of the machine are as follows: The shortest piece of pipe that can be threaded without a special holder is about 4½ in. between threads; the size of the loose pulleys, 16 x 8 in., size of tight pulleys, 16 x 4 in.; speed of the countershaft, 250 rev. per min.; the extreme floor space, 40 x 110 in.; the domestic shipping weight, 6900 lb., and the size of motor required, 3 hp.



The Duplex No. 8 Improved Pipe Threading and Cutting Off Machine Built by the Bignall & Keeler Mfg. Company, Edwardsville, Ill.

The Michigan Copper & Brass Company's Growth.—Charles Sparks, manager of sales of the Michigan Copper & Brass Company, Detroit, Mich., has issued a circular letter to customers which gives some interesting facts regarding the growth of the company's business:

"On August 22, 1907, we billed the first pound of brass turned out of this mill. In August, 1908, one year later, the output was 45 times as large as in the first 30 days the mill was in operation. In July of this year the shipments were more than 70 times as large as those made during the first month. August not being completed, we cannot make comparison with August of a year ago, but at the present writing we have orders for more of our product than we have ever received to the same date in any month since the mill was started. There is a reason for this. Good metal and good service tell the whole story. We have endeavored to satisfy our customers and they have shown their appreciation by giving us liberal orders. One thing particularly that has contributed very largely to the rapid growth of this business is the fact that we furnish metal to manufacturers that is best adapted to the class of work they produce. It is hardly necessary to point out how this saves in manufacturing cost."

The American Railway Association reports that between August 4 and August 18 the freight car surplus was reduced by 47,749 cars, or to 159,424. The reduction from 12 months preceding was 93,579. In the fortnight mentioned box cars decreased 21,141, and coal cars and gondolas 19,328. There was also a decrease of 6248 in miscellaneous cars.

Toledo Electric Welding Machines.

The welding of metals is an art nearly as old as the use of iron, but until within a comparatively few years no decided changes have been made in the methods employed. The leather aproned blacksmith heating two pieces of iron in a forge, then hammering them together by main strength and a liberal sprinkling of welding compound, rarely understands the chemistry of the process that is going on before his eyes. The welding compound (consisting mainly of borax) melts and covers the surface of the metal, and the chemical action reduces the oxide scale to the liquid state and at the same time prevents further access of air to the heated surface. When the pieces are hammered, the burnt metal and flux is forced out, the reliability of the weld depending altogether on the judgment of the man behind the hammer in bringing the metal to the right temperature, and his skill in hammering out all of the burnt particles of metal and oxide scale. Electric welding is simple by comparison so far as skill is concerned on the part of the operator. A boy with a welding machine can weld more pieces of a given kind in a day than a dozen skilled blacksmiths could possibly turn out.

The underlying principle of the electric welder is that a poor conductor of electricity will offer so much resistance to the flow of current that it will heat. The degree of heat depends upon the amount of current and the resistance of the conductor. The same is true of an incandescent lamp. The copper wires leading to the lamp are good conductors and remain cool, but the carbon filament of the lamp, being a poor conductor and offering such a great resistance to the flow of current, becomes white hot or reaches a state of incandescence.

The process of electric welding is especially applicable to the butt welding of metals having practically the same cross section at the weld. With the electric current the heat can be applied at any point desired, and, limiting it largely to this spot, as is done, the energy is concentrated just where it is needed. The temperature can be maintained at any point desired for any length of time, and any degree of heat can be obtained up to the melting point of the metal and can be increased or decreased at the will of the operator. This is done by turning the current on and off by means of a switch on the machine. The metal can be watched while heating, as it is visible at all times. The pieces heat gradually as in a coke fire and no goggles or smoked glasses are used or required. As the heat is entirely between the clamping or vise jaws that hold the pieces to be welded, it is confined to the joint and there is no energy wasted in heating more material than is required to make the weld. No flux is required in making an ordinary weld and there is no blistering or scaling.

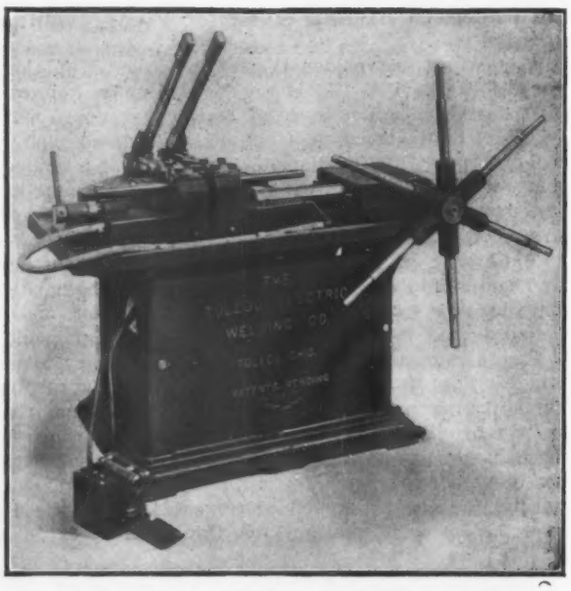


Fig. 2.—A Larger Machine for Tubing, Rods, &c.

It is one of the properties of an electric current to follow the path of least resistance. Inversely, the greater resistance, the more heat. When the ends of two pieces of metal are brought together, this is the point of greatest resistance, and the abutting ends will instantly begin to heat. The hotter the metal becomes the greater is its resistance to the flow of current; consequently, as the edges of the abutting ends heat the current is forced into the adjacent cooler parts until there is a uniform heat throughout the entire mass; all of this is accomplished entirely automatically.

Fig. 1.—A Small Toledo Electric Welder for Welding Drills to Shanks.

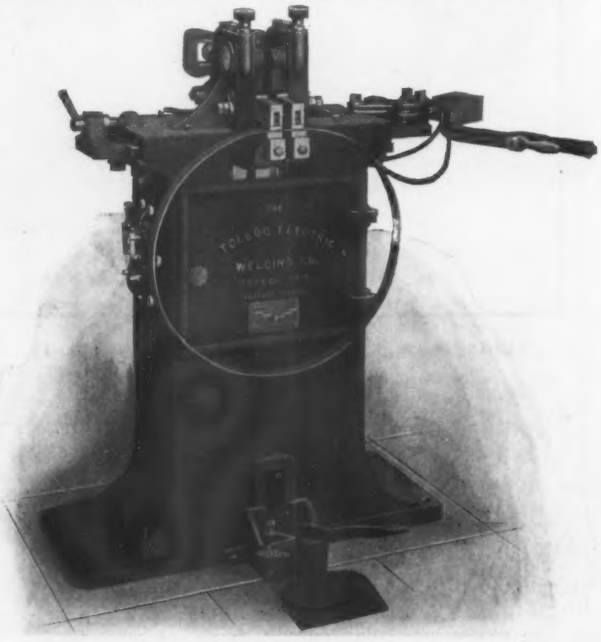


Fig. 3.—A Universal Welder with Which Hoops Can Be Joined.

For electric welding alternating current is required. In nearly all cities and towns the current can be bought from the local lighting company at a price so low that it would not pay to invest in a dynamo, solely for this work, unless a number of welders are installed. The local company will furnish a transformer adapted for either 220 or 440 volts. Two wires are run from this transformer direct to the welder, which is equipped with a special transformer that further reduces the pressure to 4 or 5 volts. This pressure is about the same as the ordinary dry battery used for door bells, and there is absolutely no danger of a shock to the operator. The

copper clamping jaws of a welder are similar to a pair of movable vise jaws and form the terminals of the secondary of a special transformer located in the welder.

When two pieces of iron are to be welded they are clamped between the viselike clamping jaws which are set from ½ to 2 in. apart, according to the size of stock to be welded. The ends of the metal to be welded touch each other. The current is turned on by means of a switch. In a few seconds the metal reaches a white heat and is in a partially molten state, when, by means of a lever, the ends of the metal are forced together while in this semifluid condition, thus making a homogeneous mass and a perfect weld. A projection or fin will be raised where the ends come together and this may be ground off or removed by a drop hammer or press. When a weld is properly made in a bar of iron or steel it is as strong at the welded point as at any other place. The heat is first developed in the interior of the metal, and the interior being the hottest, the metal is welded at this point as perfectly as at the surface. When welded in a forge the outer surface is heated first and very often the inner part is not as perfectly joined together as the surface, the result being an imperfect weld.

The Toledo Electric Welding Company, Toledo, Ohio, has brought out a very complete line of welding machines for various purposes, a few of which are illustrated.

Fig. 1 shows a special machine for welding small drills; one of the drills is shown in the machine. The operation of this machine is simple, no expert operator is required, and work can be turned out very rapidly. The head on the left holds a chucking jaw to hold the blade of the drill. Sockets are provided for the different sizes of drills and are held rigidly in the chuck jaws. The varying lengths of drills are taken care of by the adjusting bolt with a knurled head, which is shown at the extreme left of the head. By this arrangement every drill of a certain size projects the same distance from the clamping jaws. The shanks of the drills are fastened in a chucking device shown at the right; the two heads are brought together by turning the pilot wheel, and as the pieces to be welded are brought together they are absolutely in alignment. The automatic switch shown at the back of the machine is adjustable and can be set to open the circuit at any predetermined point. This enables the operator to set the machine to make the welds with the greatest degree of accuracy. After the weld is made the drill is automatically thrown out and the chucking jaws are in position to receive another drill.

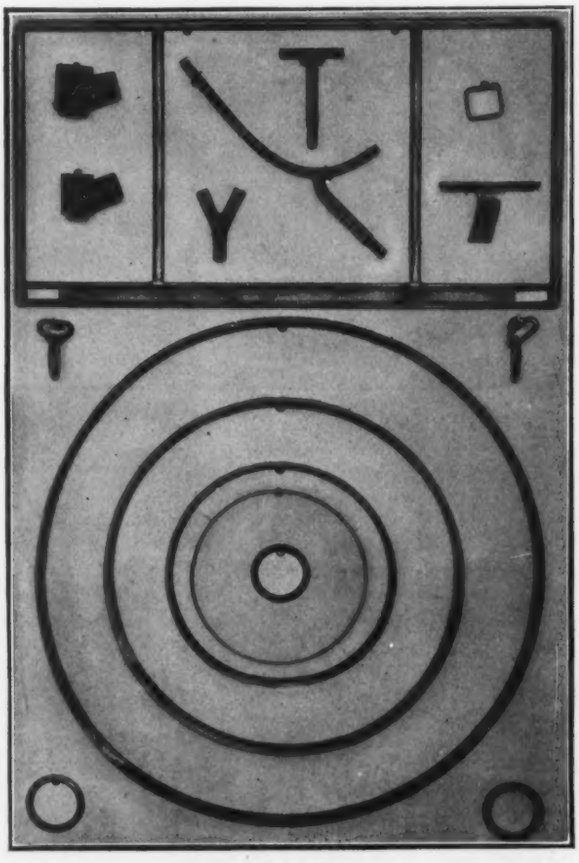


Fig. 4.—Examples of Work Done on a Universal Welder.

Fig. 2 shows a larger machine designed for welding tubing, automobile steering rods, &c., or solid stock up to and including 1⅛ in. round iron or steel. The stock is clamped in the copper jaws by the hand levers shown on top of the machine. The right head moves back and forth in sliding ways and is actuated by the pilot wheel shown at the right side of the machine. The current is turned on and off by the foot switch shown on the floor at the base of the machine. The clamping dies come far enough above the top of the table to allow bars or tubes of any length to be conveniently handled and are welded without interfering with any of the working mechanism; at the same time the line of thrust is in the center of the work holding jaws, thus insuring absolute alignment of parts when welded. The copper dies are water cooled in all of these machines. As the illustrations show, the welders are solid and massive in design and well adapted for the use and abuse they are subjected to in service. They are usually placed in the hands of ordinary operators, having no experience with machinery, and are designed to stand the work imposed on them under the most exacting conditions.

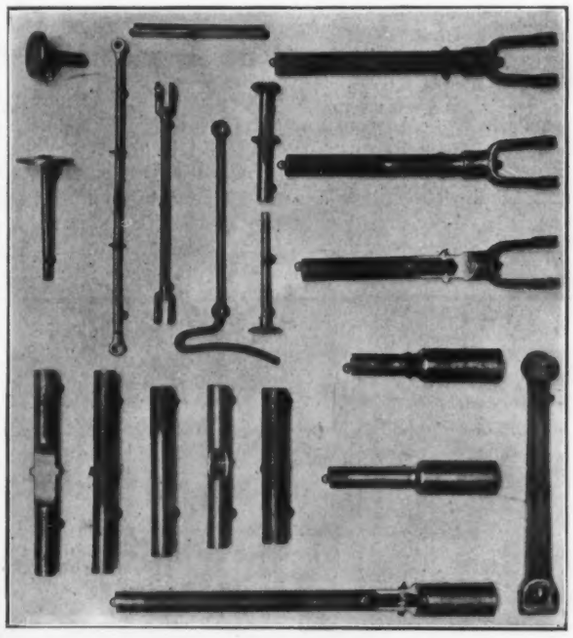


Fig. 5.—Examples of Work Done with the Plain Welders.

Fig. 3 shows a universal welder designed to weld up to and including ¾-in. solid steel or iron. The clamping jaws are actuated by foot treadles and the current is turned on and off by a switch mounted on the lower handle shown at the right. A few welded pieces are shown in Figs. 4 and 5, which will give some idea of the great variety of work that can be done by this method. It is, however, a quantity proposition for the man with a great number of duplicate parts to weld or braze and is not adapted for the average blacksmith or repair man who has only a few pieces to weld per day.

To give some idea of the cost of current for electric welding and the time required the following table has been prepared:

Round iron or steel.—Inches.	Seconds to make a weld.	Cost of 1000 welds at 1 cent per kilowatt-hour.
¼	3	0.07
⅜	5	0.13
½	7	0.22
⅝	10	0.33
¾	12	0.50
1	20	1.50

The price per 1000 welds is based on current at 1 cent per kilowatt-hour. If current costs 3 or 5 cents, the price given above must be multiplied by this higher rate.

The No. 2 1-2 Universal Horizontal Boring Machine.

The Universal Boring Machine Company, Hudson, Mass., has lately placed on the market a No. 2½ universal (horizontal) boring machine with an extra long bed to facilitate the machining of large castings. This machine has been built with a special view to accuracy and permanence of alignment, and is accurately fitted to surface plates and straight edges and carefully lined up to be true throughout the range of its various adjustments. The machine is especially adaptable to jig work and the like where it is necessary to do very accurate boring, milling and drilling, the machine itself being used to lay out the work.

Fig. 1 is a general view of the machine. As may be seen, the tool is a constant drive geared machine. The bed is of deep box construction and is heavily ribbed, insuring stability, an essential feature in a machine of this kind. This gives a solid foundation to the other members of the machine, and keeps them in accurate relation to each other in all positions and eliminates the necessity of building a foundation under the machine. As a foundation is not necessary, the location of the machine is not confined to the ground floor. The bed rests on three points, facilitating easy leveling, especially on uneven floors, and at the same time avoiding any undue strain on the bed.

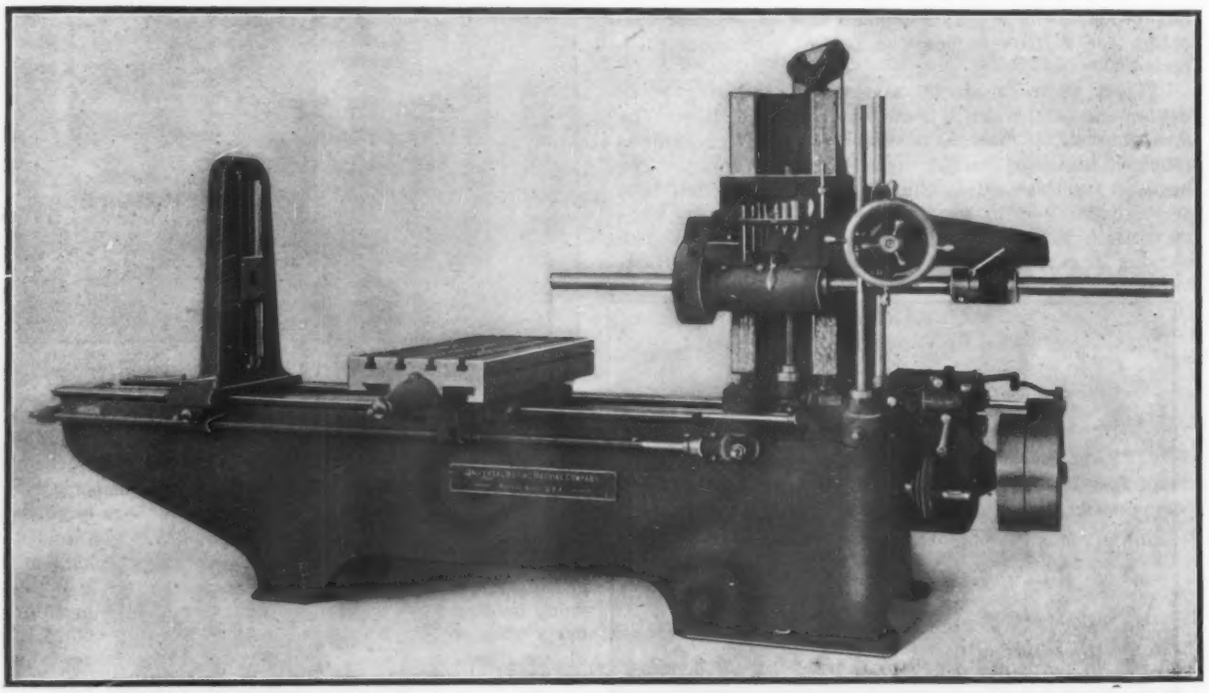


Fig. 1.—The No. 2½ Universal Horizontal Boring Machine with Extra Long Bed, Built by the Universal Boring Machine Company, Hudson, Mass.

Prominent among the features of the machine is the placing of the head on the right end of the bed. This permits running the spindle in the same direction for milling as for boring and drilling, and is convenient as well for the operator. The hand wheel for the rapid adjustment of the spindle being placed on the head well in toward the cutter allows the operator to see his milling cutter and make adjustment at the same time. Work on this machine can be bored, drilled and milled in any direction at one setting when using the rotary table. The work is done accurately without any measuring, since the machine itself can be used to lay out the work. An accurately laid out jig is insured on this machine, as particular attention has been given to the machining and fitting of all parts. All shafts have been brought in perfect alignment and great care taken in the adjustment of all feed screws, each having a large collar on it graduated to one thousandths inch, thus permitting fine adjustments.

Fig. 2 shows a cross section of the head and the feed and speed gear box. Here will be noticed a power vertical feed to the head for milling purposes, which is a valuable feature for many classes of work. Aside from the regular vertical milling feed, the head has a power quick constant feed raising and lowering device, both, however, being operated by a single lever. A hand feed for fine adjustments of the head by a micrometer dial is also furnished. The head is properly counterbalanced and is moved by a large screw of coarse pitch accurately cut; suitable arrangement has been made for oiling the sliding surfaces, minimizing the wear.

The gear box is strong and compact and contains the feed and speed change gears, which are of steel; these gears run in a bath of oil, providing sufficient lubrication, quiet running and consequent long wear. Eight speed changes are secured from the gear box, and these are doubled at the head, as will be seen in Fig. 2, by the back gear lever. There are nine feed changes in either direction for the head; one lever reverses or stops all feeds and retains their relation to each other.

The spindle has an all geared drive from a constant speed shaft. The driving of this spindle is at a point nearest the work and therefore a torsional strain does not occur throughout the entire length of the spindle. This manner of drive is of special advantage in securing stiffness in large milling cutters, and at the same time eliminating the chatter usually present in taking heavy milling cuts on machines having the drive at a long distance from the work. It will be noticed in Fig. 2 that the driving gear has a long hub in which the spindle is held by two sliding keys. The spindle itself runs in self-oiling bearings, as will be seen in Fig. 2, which have an individual oil compartment containing enough oil for about 20 months' running. The bronze bearings, which are fitted into the bearing proper, have a groove cut the entire length, in which is laid a wicking with its ends dipping into the oil compartment below. The bearing proper is split also and provided with clamp screws for taking up any wear that may occur.

In Fig. 2 may also be seen a cross section of the tight and loose pulleys on the driving shaft. The loose pulley is slightly smaller in diameter than the tight pulley; thus there is practically no tension on the belt when running on the loose pulley, minimizing the wear of the loose pulley on the shaft. The loose pulley is of single piece construction, and an oil reservoir is cored out around the bearing and this space filled with cotton

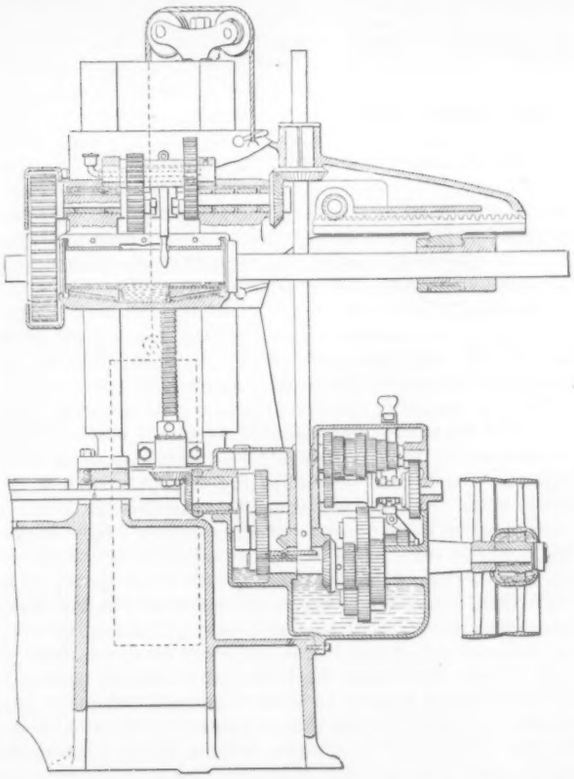


Fig. 2.—Cross Section of the Head and the Speed and Feed Box.

waste and oil. A wicking is laid in a groove cut in the bearing, the ends of which dip into the reservoir below.

As will be seen in Fig. 1, the platen is extra thick to avoid springing when clamping down the work and has power feed in either direction, with automatic stops. The screw which moves the platen carries a dial reading in thousandths inch, and the gears which operate the feed screw are incased and run in oil. There are four milled T slots running the length of the table,and provision has been made for applying a rotary table.

The feed motion on this machine is taken from the driving shaft, which runs at a higher speed than the spindle. This makes it possible to obtain four speeds without gearing up, thus avoiding the excessive strain on the feed gears and bearings. The fine feeds are obtained by reducing gearing.

The rotary table is shown in Fig. 3, together with its four clamps and center stud. This table is 24 in. in diameter and is graduated in ½ degrees. The milling feed to the table, making the machine universal, together with the rotary table, permits finishing at one setting many kinds of work which would otherwise require resetting and finishing in other machines. This graduated revolving table allows holes to be bored and drilled and surfaces to be milled at various angles, doing several operations at one setting, resulting in more work and less preparation.

An auxiliary table, as shown in Fig. 5, is furnished

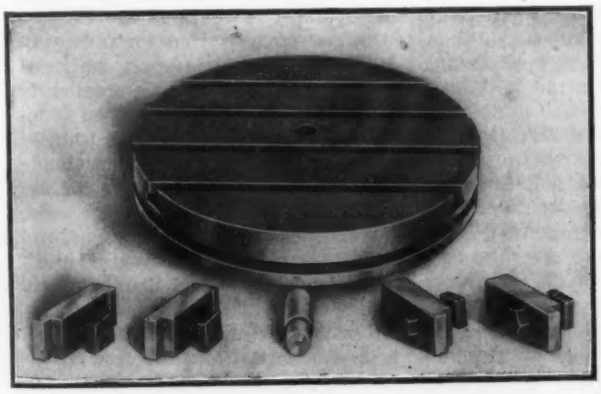


Fig. 3.—The Rotary Work Table.

for work overhanging the regular table and has a milled T slot its length. This auxiliary table is very important when machining large castings, since they can either be bolted to the table or travel on it.

The outer support bearings for the boring bars is gibbed to the internal guiding surfaces of the support. The raising and lowering of the bearing is accomplished through a screw connected by spiral gearing and splined shafts to the elevating screws of the spindle head, so that the two move together simultaneously. Provision has been made for the realignment of the bearings in case of wear. The outer support post is accurately fitted to the bed of the machine and is moved longitudinally on the bed by a hand crank. It can be easily removed from the machine by removing the bracket at the end of the bed and pulling the post off, and can be replaced in exact alignment without any trouble.

Extension boring bars with bushing to fit in the outer support bearing are furnished with the machine, and one roughing and one finishing cutter for each boring bar. These extension boring bars are fitted to a No. 4 Morse taper hole in the spindle. The spindle also has a slot for locking the extension boring bars by means of two wedges in addition to the usual drift slot. Two face milling cutters may be furnished with the machine. The hub of the driving gear forms a face plate, to which a 10-in. face milling cutter is fastened by four cap screws. This arrangement makes the most rigid connection pos-

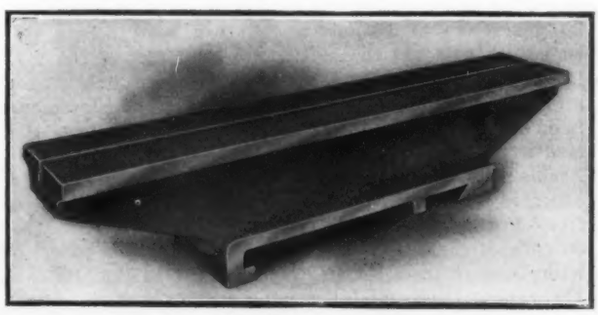


Fig. 4.—The Auxiliary Table.

sible for the cutter. A 2-in. face milling cutter is fastened to an arbor which is fitted to the No. 4 Morse taper hole in the end of the spindle. The 10-in. face milling cutter is provided with a center hole large enough to allow the spindle carrying the 2-in. face milling cutter to pass through. Thus either cutter may be used without the necessity of removing the other.

This machine will take 94 in. between the face plate and the outer support for the boring bar, the greatest distance from the top of the platen to the center of the spindle is 22¾ in., and the platen, which is 20 in. wide by 42 in. long, has a cross feed of 34 in.

Hill, Clarke & Co., Inc., Boston and Chicago, with branch offices at New York, Philadelphia and Cleveland, are the selling agents for this machine, and it may be seen in operation at any one of their demonstration shops.

Transvaal Power Utilization.—Consul Edwin N. Gumsaulus, of Johannesburg, writes to the Department of Commerce and Labor that, in addition to the great scheme for supplying power to the Rand, a new company, to be known as the Pretoria Power Company, is being formed to supply power and to manufacture, at a hydro-electric station on Crocodile River, nitrate of lime and nitric acid. Three large banks in Europe are said to be supplying the capital. For the initial works, which are to furnish 20,000 to 25,000 hp., $3,469,875 will be required, and for the nitrate of lime and nitric avid works $1,250,000 additional will be necessary. The present cost of nitrate of soda delivered to South African ports is about $54 per ton, while nitrate of lime, which serves the same purpose as a fertilizer, can be produced and sold, it is said, at half that price in the Transvaal. There is considerable demand for nitric acid in South Africa for use in the manufacture of dynamite for mining purposes.

RAILROAD BUILDING IN ASIA.

Active Development Now Under Way.

BY JOHN FOORD, SECRETARY OF THE AMERICAN ASIATIC ASSOCIATION.

The railroad builder is at work in Asia as never before. Ten years ago, Benjamin Taylor asked his fellow countrymen the pertinent question: "Do we realize all that is implied in the fact that of about 450,000 miles of railroad in the world, Asia has not more than 30,000—that while Europe has a mile of railroad for every 2,400 inhabitants, Asia has one only for every 28,000?" Reference was added to the overwhelming character of the mere thought of the work involved in remedying this disproportion and of the enormous possibilities of the Pacific area when railroads and steam and mechanical invention have had a chance to do for its teeming populations what they have done for the peoples in the Atlantic area. But already the mileage actually in operation in Asia is expanding so rapidly that the figures of one year become worthless almost as soon as they are tabulated.

The Work Now in Progress.

At one end of Asia the Germans are at work tunneling the Taurus Mountains; at the other, the Russians are preparing to attack the problem before which they quailed 20 years ago of conducting an iron road across the rugged chasms and through the rocky defiles of the valley of the Amur. To supply the Western link of an all-British south Asiatic railroad, a serious movement is on foot looking to the construction of a line from the Mediterranean to the Persian Gulf, across Northern Arabia; and under the direction of a Chinese engineer educated in America there has just been completed a line from Peking to Kalgan as the first step toward the crossing of the Gobi desert and the making of a junction with the trans-Siberian railroad at Lake Baikal. Throughout the great intervening stretch of 7,000 miles, between these contrasted spheres of railroad enterprise at either extremity of Asia, existing railroads are being extended and new ones planned. The Indian roads are reaching out on one side through Burmah to the frontier of China, and on the other through Beloochistan to southern Persia, now at length open to the railroad builder.

A few months ago, two states, formerly feudatory to Siam, passed under the suzerainty of Great Britain, and it was one of the terms of the bargain that the Federated Malay States should advance to Siam on easy terms $20,000,000 for the purpose of constructing a railroad from Bangkok to the Malaysian boundary. In Indo-China the French have already built 820 miles, and are extending their system eastward to participate in the great trade of southern China that is and will continue to be tributary to Canton, and north and westward into the Chinese province of Yunnan. In China itself the progress of railroad building which was described in *The Iron Age* of November 23, 1905, has made rapid strides, and American capital and enterprise, which had then retired discouraged from the field, have reappeared with a peremptory demand to have their share in financing projects which were coming to be regarded as exclusively destined for the employment of European capital and the consumption of European railroad material.

Political Considerations Influence This Development.

All this lies on the surface of the record, which he who runs may read, and reading, compile. But we shall have a very imperfect appreciation of the railroad situation in Asia if we fail to take account of the political considerations which have hitherto controlled it and of the radical changes in the situation which have followed the Russo-Japanese war and been modified by the entente firmly established between Great Britain, France and Russia. It is true that in these days all politics ultimately resolves itself into the interests of trade, and that the political stimulus given to railroad building is, in the last analysis, commercial. But there must be admitted to be an essential difference between a railroad constructed in obedience to a deliberate policy of acquiring territory or markets by conquest and one provided with the sole view of developing a profitable traffic without the establishment either of a sphere of interest or one of sovereignty.

To give an intelligible idea of the forces that have gone to the making of the present railroad situation in Asia, a brief historical retrospect is necessary:

It was hardly at the call of commercial necessity that the Czar Alexander III issued his famous edict: "Let a railroad be built across Siberia in the shortest way possible." It is true that when the enterprise was fairly under way, and the sums annually expended on it began to assume startling proportions, reference began to be made to the experience of our own Pacific railroads, as an illustration of how quickly traffic might grow in a new country and desert places traversed by the iron road become populous. For obvious reasons, the analogy was not apt, though if a political precedent were required it would have been sufficient to say that Russia needed a railroad across Siberia to bind the two divisions of her empire as much as the United States did to attach the Pacific States and Territories to the Union. But here again there was a notable difference, for the shortest way between the country east of Lake Baikal and the port to which Russians had given the proud title of Vladivostok, or "dominator of the Pacific," lay through the territory of a neighbor. That is to say, to avoid the great northern bend made by the Amur and save the construction of bridges and tunnels to span the innumerable streams and pierce the formidable mountains of that region, it was necessary to take the shorter and comparatively easy cut across Chinese Manchuria.

So, ten years after the issue of the Czar's edict, permission was given to construct a railroad, to be called the Eastern Chinese, from Stretensk to Vladivostok by way of an obscure settlement on the Sungari, since known to fame as Harbin. This was the agreement of September 6, 1896, between the Chinese Government and the Russo-Chinese Bank. A Russian Commission which went through the country about that time gave away, rather naively, on its return to Odessa, the real purpose of the Manchurian railroad as follows: "The Chinese are not only delighted with the idea, from which they expect great benefits, both in commerce and agriculture, but openly state that they would be more than delighted if all Manchuria became Russian territory and that the greater part of the inhabitants in such a case would cut off their pigtails or, in other words, become Russian subjects." Thus was a beginning made in what Prince Ukhtomsky, four years later, called Manchuria's "painless identification with Russia."

How Russia Advanced Her Interests in China.

It was, of course, expected that the process would be greatly facilitated by the agreement of March, 1898, under which permission was obtained to continue the Eastern Chinese railroad southward from Harbin to Tailenwan and Port Arthur. In spite of the declaration contained in the agreement of 1898, that this railroad concession is never to be used as a pretext for encroachment on Chinese territory, nor to be allowed to interfere with Chinese authority or interests, the agreement was no sooner made than it was used as the basis of protest against the extension of the Imperial Chinese railroads beyond the Great Wall on money borrowed from a British syndicate on the security of the lines already constructed south of the wall between Peking, Tientsin and Shanhaikwan.

To the British Ambassador at St. Petersburg, Count Mouravieff gave the Russian view of the situation as follows: "Taking up a map of north China, he drew attention to the projected line for the Northern Extension railroad to Newchwang and the close propinquity of the northern terminus to the line which was to serve as outlet

for the trade of the Russian trans-Siberian railroad. He had concluded and signed an agreement with the Chinese Government by which China agreed that if this extension was made the line should only be constructed with China's own money and always remain in Chinese hands and under Chinese control. . . . This agreement was not directed against the interests of England or of any other power; the limitation being general in its character, applying to all non-Chinese charters, Russians included, could not be regarded as infringing the treaty rights of most favored nations. The agreement itself was one which two independent powers were clearly entitled to conclude."

The upshot of the controversy was that the Russian Government withdrew its objections to the building of the railroad from Shanhaikwan to Newchwang, with a branch line to Hsin-min-ting (30 miles northwest of Mukden), and that an agreement was made between the governments of Great Britain and Russia under which "Great Britain engages not to seek for her own account, or on behalf of British subjects or of others, any railroad concessions to the north of the Great Wall of China, and not to obstruct, directly or indirectly, applications for railroad concessions in that region, supported by the Russian Government. Russia, on her part, engages not to seek for her own account, or on behalf of Russian subjects or of others, any railroad concessions in the basin of the Yangtse, and not to obstruct, directly or indirectly, applications for railroad concessions in that region supported by the Russian Government."

Russia Determined to Prevent All Continuous Railroads Across Asia but Her Own.

While the northern extension of the Imperial Chinese railroads was under discussion the Russian Foreign Minister had declared that "as regarded railroad enterprises to the south of Peking in central and southern China neither the Russian Government nor Russian enterprise had any interest whatever, and all the persistent rumors to the effect that the Russian Government or Russian money had any share in the Belgian railroad concession schemes were quite unfounded." The Belgian concession was for the construction of the railroad from Peking to Hankow, 760 miles up the Yangtse, in the heart of China. Outside observers of Russian policy might, however, be pardoned for remembering the close connection between the Belgian syndicate and the Russo-Chinese Bank and for speculating on how long it would take Russia to digest Manchuria. In any case, there remained the stubborn fact that Russia was determined that there should be no further interference with her monopoly of railroad construction and operation in the three Eastern provinces of China, and that, moreover, as the *Novoe Vremya* blurted out in April, 1898, she was determined to possess her own rail from Manchuria to the capital of Korea. Recalling the further fact that Russia was equally determined that, if she could prevent it, there should be no continuous railroad across Asia except her own, the change which the Russian collapse wrought in the Asiatic railroad situation may be partially understood.

Had commercial considerations dominated the construction of a trans-Asiatic road, the southern route would necessarily have been preferred. Here there are both trade and population, and the distance of 2,000 miles across the Indian Peninsula is already traversed by railroads. In Central Asia, the Russian railroad builder had been already at work a quarter of a century before. It took Russia ten years to subdue the wild Turcoman tribes of trans-Caspia, but, that done, the work of connecting the Caspian by railroad with Merv, Bokhara and Samarcand was promptly begun. The first 700 miles of this railroad was laid across a howling wilderness on which were but four small oases. It was begun in 1880 completed to Samarcand, and was paying its expenses in 1890. Since then trade and traffic have developed rapidly, and communication with Russia proper has been so far perfected that a traveler from Moscow can now reach the Afghan frontier, within 60 miles of Herat, in five days. Ashkabad, the capital of trans-Caspia, and an important Russian railroad center, is only 160 miles northwest of Meshed, the capital of the Persian province of Khorasan.

As soon as the Russians got their railroad to Ashkabad they insisted on the Persians building a good road from the frontier to Meshed, so as to connect the three places and furnish an outlet to Persia for the rail-borne commerce of Russia. The cart road cost the Persians some $150,000, and it was used as a highway for Russian commerce only. For railroads, Persia was to remain forbidden territory. That decision was reached in the early eighties, when Russia beat England in the struggle for influence at Teheran. It was as an offset to the trade and mining concessions granted to Sir Henry Drummond Wolff, the England Minister at the court of the Shah, that the Russian Minister demanded and received the sweeping concession against progress that no railroad should be allowed in Persia. As Truxton Beale, formerly our Minister there, put the case: "Persia was to lie fallow, free from foreign entanglements, until Russia saw fit to make use of her."

Some five years later, Russia made her hold on Persia more secure by advancing to the government of the Shah 22,500,000 roubles. About that time, Great Britain had been moved to prevent the acquisition by France of a coaling station at Muscat, near the eastern entrance of the Persian Gulf. This conjunction of events elicited the following suggestive comment from a French newspaper published in Shanghai: "It is a fine revenge for the Muscat episode; more than that, it is the postponement to the Greek Kalends of the (British) trans-Asiatic railroad. Russia has determined to prevent without fighting any competition with her trans-Siberian railroad; it is as clever as it is happy."

German Influence Appears.

Meanwhile, the Germans had appeared on the scene. In December, 1899, our Consul at Sivas announced that the controversy in regard to railroad construction in Asia Minor had been settled by a concession granted to the Anatolia Railroad Company, which was to extend the then existing line, terminating at Konia, via Marash and Bagdad to Bassorah. It was added that few railroad lines could be of greater prospective importance than this 2,000 miles of railroad uniting the Persian Gulf with Europe, forming a rapid transit to and from the East, opening up large tracts of agricultural country, and paving the way for German commercial supremacy in Asia Minor and Mesopotamia. As a matter of fact, the project was an old one. Sixty-four years previous to the Sultan's grant to the Anatolia Railroad Company, Sir Francis Chesney had surveyed for the British Government the route for a railroad along the Euphrates Valley from the Mediterranean to the Persian Gulf. For half a century the construction of this very important link in the overland route to India has been one of the imperial ambitions of Great Britain, and it was only after the acquisition of a controlling interest in the Suez Canal shares and the occupation of Egypt that the Euphrates Valley scheme passed out of the range of discussion.

In September, 1886, it was reported that a concession for a system of Anatolian lines had been discussed in Europe, and it was regarded as a remarkable revelation of the progress of German influence at Constantinople. The project fell through apparently because the concessionaires failed to appreciate the proper methods of acquiring favor with Turkish ministers. The concession was actually granted in 1887 to an English syndicate, with power to extend the line to Bagdad within ten years, but it was again revoked.

When the contract for the line to Angora, opened in 1892, was refused to English and French syndicates it was granted to the German company because the Sultan and his ministers had no experience of German ability in such enterprises, and intrusted them with the work upon the theory that they were the least likely upon the whole to carry it out. The rapidity and thoroughness with which the line was completed opened the eyes of the Porte to German capacity in the matter of railroad building, and in 1896 the line was established to Konia. From that point it was evident that the first part of any

possible trunk line from Constantinople to the Persian Gulf was already in German hands, so that the sequel to the competition for the construction of the Bagdad railroad was already certain. The well-known director of the Deutsche Bank, the late Dr. Siemens, was the chief agent in this transaction, which resulted in the Bagdad railroad convention of December 23, 1899. Under that agreement, the Anatolia Railroad Company undertook to construct within a maximum period of eight years and to exploit a railroad line of the regular gauge of 1.44 metres from Konia to Bassorah, by way of Bagdad, on conditions and guarantees to be determined by common agreement between the Sublime Porte and the company.

The most important part of these guarantees was that known as "kilometric." Each concession for the various sections of the road carried with it a kilometric guarantee of progressive amount until it attained the maximum of $3300 per kilometre. The delay in the construction of this line, which has only shown marked activity during the last year or two, has been due to the poverty of the Turkish treasury and to the indisposition of the powers to grant the requisite increase of Turkish customs required to meet this new draft on the national finances.

The German colonial enthusiasts promptly urged that steps should be taken to form solid self-governing settlements of German emigrants in Asia Minor, but the Director of the Deutsche Bank curtly reminded them that the Sultan would never consent to the gradual occupation of his territory by agricultural army corps. It was accordingly given out that the Anatolian Railway Company had no thought of meddling with politics; but behind all German utterances on the subject it was shrewdly suspected that there lay the conviction that commercial interests gradually convert themselves into political possessions in weak states. Even Dr. Siemens agreed that Mesopotamia, with the marvelous Babylonian system of irrigation restored, must become the granary of the East once more, relieving industrial Germany from its present dependence upon American and Russian wheat. As a matter of fact, within the present year General Sir William Willcocks has been intrusted with the task of superintending the reorganization of the ancient irrigation systems of this region. Nothing but the sheer neglect of centuries has led to the decay of one of the most extraordinarily fertile countries of the ancient world, and all expert observers have testified to the fact that the restoration and proper maintenance of the old canals will bring back the productiveness, trade, and civilization of past ages.

An All-British Railroad Project Across Southern Asia.

The progress of the Bagdad railroad and the new understanding between Russia and England about Persia have tended to revive the discussion of an overland route to India and an all-British railroad line across Southern Asia. As long ago as September, 1899, there appeared in the *Nineteenth Century* an article by the well-known English engineer C. A. Moreing, entitled "An All-British Railway to China." Mr. Moreing argued that, as Russia was then strengthening her influence and recasting the map of Asia in her own interests by building a trunk line to China, Great Britain should do the same; only, the British road should be a continuous line from the Mediterranean to the Yangtse, through southern Asia. Part of this contemplated railroad—that passing through India—was already built, and it would not take long to extend the system to Burmah. In the whole distance to be traversed, Mr. Moreing could find no difficulties equal to those which the Russians had encountered on their line, and he gave the following as his deliberate judgment in regard to the whole scheme: "It has for some time been apparent to those who have studied the political development of Arabia, Persia, and Beloochistan, to say nothing of Farther India, that Great Britain is the future mistress of southern Asia. No other European nation will ever be permitted to settle on the shores of the Indian Ocean, and the surest way of consolidating our rule in a region where no other power but ours can be allowed to intrude is to link up our scattered possessions and supply the quick means of communication that a railroad from the Mediterranean to mid-China would afford.'"

For obvious reasons, Mr. Moreing rejected any idea of reviving the old Euphrates Valley project, and proposed to start his all-British south Asiatic railroad from Alexandria and proceed through the Isthmus of Sinai, northern Arabia, the Persian Gulf and Beloochistan. He showed that it was only 2400 miles from the Mediterranean to Karachi, which could be done in three days, as against the nine or ten days which a steamer requires. Indian lines would take the passenger on to Kunlong Ferry on the Chinese frontier, while surveys have shown the existence of practicable routes from Kunlong Ferry to the Upper Yangtse.

Curiously enough, the same magazine that published Mr. Moreing's article in 1899 contained another on the same subject in January of the present year. This is entitled "A Railway to India" and the author is C. E. D. Black, lately in charge of the Geographical Department of the India Office. This writer takes his cue from the completion of the Hedjaz or Pilgrim railroad to Medina, which he thinks may prove an epoch-making event for Great Britain. It is the first railroad opened in Arabia, and Arabia and Persia are the two countries that block access—though in another sense they may be said actually to supply the opportunity for communication—between India and the Mediterranean. It should perhaps be explained that it was the Bagdad railroad project which suggested to the late Sultan an ambitious scheme of his own—the Damascus-Hedjaz railroad. Abdul Hamid engineered this out of his own purse, supplemented by contributions from good Mohammedans, and it was largely built by the free labor of Turkish troops. The line is a narrow gauge one, but, by an agreement with the Franco-Belgian company operating from Beyroot, the Sultan simultaneously provided for the linking of the Hedjaz line, whose ultimate destination is Mecca, with the Bagdad project at or near Aleppo.

A Shorter Route to India Than the Sea.

But to return to the overland route to India, Mr. Black points out that between London and Port Said there is no route under British control except the sea. Thus, when one reaches Egypt, the half-way house to the East, the question inevitably suggests itself: "Cannot a shorter and more direct route to India be found than the long round about way down the Red Sea and across the Indian Ocean to Karachi or Bombay?" A railroad following more or less directly the thirtieth parallel of latitude from Egypt through northern Arabia and southtrn Persia to Quetta or Karachi would traverse the shortest line between Egypt and India and prove an immense convenience to traders, soldiers, civilians and others traveling in either direction between these two countries.

To describe this route rather more in detail: The westernmost section would start from Port Said or Ismailia, where it would join the Egyptian railroad system—the last section of the Cape to Cairo line—and traverse Arabia Petraea in a southeasterly direction to the head of the Gulf of Akabah. Thence the line would ascend the Wady-el-Ithm, one of the lateral gorges leading up to the plateau of northern Arabia. Across the neck of the Arabian Peninsula the line would pass due east for 800 miles to Bassorah, a short branch diverging to the port of Koweit, near the head of the Persian Gulf, which the Germans have earmarked as the southern terminus of their system.

This is, unquestionably, "the short cut of the land route to India," though Mr. Black is mistaken in saying that it was never suggested as a feasible route to Karachi or Bombay before he examined the geography of the region. As far back as 1863, when W. G. Palgrave crossed the whole breadth of Arabia from the Red Sea to Bahrein in the Persian Gulf, he found a well-watered country, admirably suited for the construction of a railroad. He found the people everywhere keen traders, and the only form of outrage he had to fear came from the minions of the government. This track across Arabia from Bahrein to Mejaz on the Red Sea is actually the most ancient

trade route of which we have any knowledge. It was by this route that, some 7000 years ago, civilization was introduced into ancient Egypt, and it was by this road that bronze first found its way to Phœnicia, and thence by Tyrian and Carthagenian traders was carried all through Europe. Its reopening would thus be only a return to primitive conditions.

At Bassorah the proposed railroad would cross the Shat-el-Arab on its way to the East, and the Karun River further on. The crossing of this stream presents no more formidable difficulties than have been surmounted in the crossing of the Yellow River in China. Circling around the head of the Persian Gulf, the railroad would traverse Persia by whatever route might be considered feasible, either passing through Shiraz, with a branch to Bushire, Kerman, and Nushki, or by a more southern line through Beloochistan as far as Karachi, where it would close with the Indian systems. Mr. Black's table of distances coincides very closely with those given by Mr. Moreing ten years ago, and he concludes that the total distance from the Mediterranean to the Indian rail head, 2200 miles, ought to be easily covered in 66 hours, as compared with 3050 miles or 9½ days in a steamship—a saving of 850 miles in point of distance and 6½ to 7 days in respect of time. As to cost, Mr. Black says that he was furnished with an estimate some years ago which was carefully framed by two experienced engineers who had personal knowledge of part of the region to be traversed. The estimate ran to $30,000 per mile, and he claims that subsequent figures, relating to the Hedjaz railroad from Damascus to Medina, and to a previous undertaking from the Syrian coast to Damascus, proved that the estimate was not too low. For a total distance of 2200 miles from the Mediterranean to the Indian frontier, this would work out to $66,000,000, or, with an addition of $15,000,000 for rolling stock, $81,000,000 altogether, or considerably less than the cost of the Suez Canal.

Shanghai the Objective Point.

From Mr. Moreing's point of view the grand objective point of this south Asiatic railroad scheme is Shanghai, the great entrance port and commercial mart of the Middle Kingdom and meeting place of the eastern and western bound steamship lines. It was already apparent, when he wrote, that from the Yangtse were to range the future lines of communication which are to open up the celestial empire. Down the upper valley of the river itself the rich products of Szechuan would be brought oceanward; from Hankow to Peking, and from the northern bank of the river opposite Chinkiang to Tientsin would run lines that would exploit northern China; while from Nanking via Soochow to Shanghai would run a British line destined to open up the rich and densely peopled alluvial tracts lying around the estuary. Since Mr. Moreing wrote, this latter enterprise has become an accomplished fact and the other lines of communication which he roughly traced are already in course of construction.

Beyond China, Mr. Moreing saw that the proposed railroad would revolutionize the traffic with Australia, as it is only 3500 miles from Madras to Perth. Nor would it be very long before an unbroken line of rail connecting Calcutta with Singapore would make the latter the port of embarkation for Australia. Briefly, it needed in 1899 no argument to show how indispensable was the proposed railroad to Great Britain if she is to keep her grip on southern Asia, and since that time the words of Mr. Moreing have probably acquired a new significance, not only for Great Britain but for the rest of the world: "The building of such a line would be a clear declaration to the world of intentions which, though known to statesmen, are only vaguely surmised by the public at large, and are ignored by the more restless and ambitious spirits of rival nations."

Active Steel Works and Rolling Mills in 1908.—The number of works in the United States which produced steel ingots or castings or rolled iron or steel in 1908 was 487 (in 29 States and the District of Columbia), as compared with 522 in 1907. Of the total number active last year 357 works rolled iron or steel into finished forms and 130 works made steel ingots or castings but not finished forms of rolled iron or steel, as compared with 383 and 139 works, respectively, in 1907. Rolled forging blooms and forging billets are regarded in this reckoning as finished products. In 1908 the number of entirely idle iron and steel plants was 113, of which 78 were equipped with hot trains of rolls and 35 were equipped to make steel ingots or steel castings only.

New Skinner Special Gear Chucks.

The illustrations show two sizes of a special three-jaw universal chuck designed by the Skinner Chuck Company, New Britain, Conn., for holding automobile gears on the pitch line. The 9 in. chuck, Fig. 1, is set for holding a 6 pitch gear with 19 teeth, the 12 in. chuck, Fig. 2, for any 6 pitch gear with a number of teeth which can be divided by three. This type of chuck is especially adapted for use on grinding machines, and

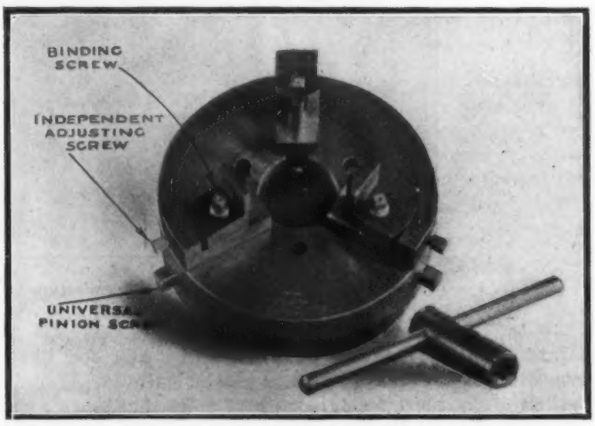


Fig. 1.—The 9-In. Gear Holding Chuck Made by the Skinner Chuck Company, New Britain, Conn.

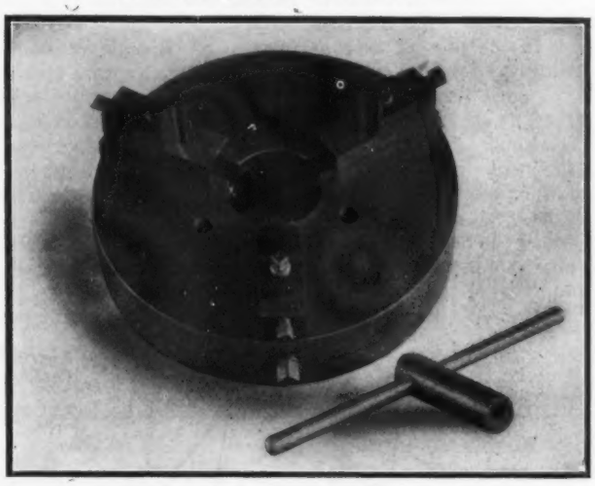


Fig. 2.—The Skinner New 12-In. Special Gear Chuck.

in the automobile industry for grinding the hole in hardened gears with precise results.

On gears with teeth not divisible by three it is necessary to loosen the binding screws on two jaws, leaving the third jaw stationary, and then place the gear in the chuck, adjusting the jaws universally by means of the pinion screws, letting each jaw find its own place, at the same time seeing that the two loose jaws move to one side the same distance. The binding screws are tightened sufficiently to hold the top jaws in this position, the gear is removed, and each jaw set an equal distance from the center with independent adjusting screws, a test indicator being used. The binding screws are then set up tight and the chuck is ready for work, holding any gear of the same number of teeth and pitch true on pitch line, at three points of contact. Gears of any other pitch may be held by using extra top jaws with rounded ends of suitable size for that particular pitch.

A Rockwell Inclinable Rotary Furnace.

The Rockwell Furnace Company, 26 Cortlandt street, New York, has recently improved its internally fired rotary furnace, so as to give a greater flexibility in range of work handled by it and greatly add to its durability. Fig. 1 shows one of the new annealing and hardening furnaces. Heretofore these furnaces were built only with special lining brick, which formed deep helical channels with separating walls for feeding the material forward. This arrangement worked very well for light, smooth pieces, such as nuts, washers, balls, &c., and is still spirally lined for this class of work, but was found to be unsuitable for long pieces, such as bolts, rivets, &c., and irregular shaped steel punchings, forgings, castings, &c., and other methods of feeding the material through the furnace were required.

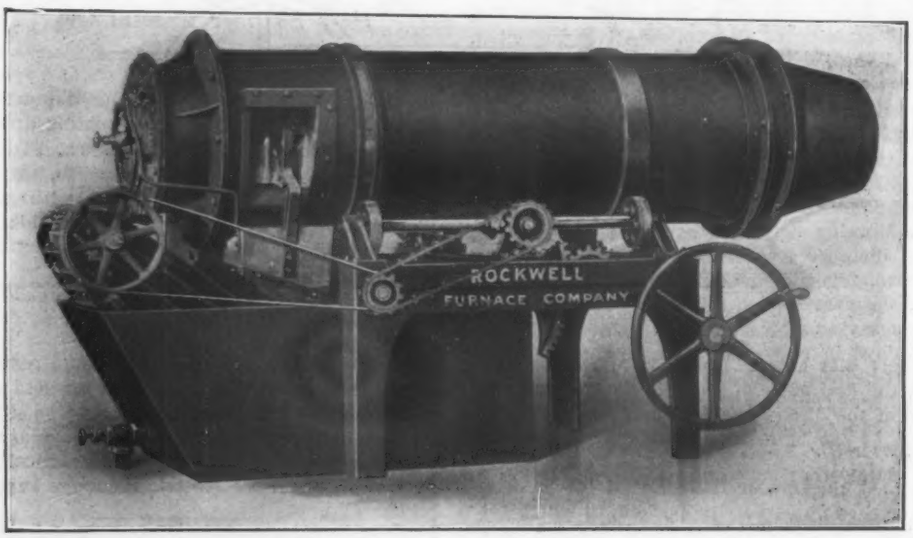


Fig. 1.—The Improved Adjustable Automatic Annealing and Hardening Furnace Built by the Rockwell Furnace Company, New York.

In the present type of furnace for smooth or round work the rotating cylinder or drum is lined with a standard hard refractory brick, with a smooth internal surface, as shown in Fig. 2. The furnace is mounted in such a manner that its axis may be tilted at an angle giving the revolving hearth an incline with the discharge end lower than the entrance or feed end. The gradual incline causes the material to feed forward, and through a hand wheel the degree of pitch may be adjusted so as to regulate the progress of the material through the furnace and consequently the time of heating.

The advantages of this method of automatic continuous heating are many; the material is charged in a hopper in bulk at the exhaust end of the furnace and fed automatically into the chamber; the material comes continually in contact with the newly heated surface of the chamber which is revolving, thereby absorbing the heat from the lining as well as from the heated gases. In a stationary furnace the heat from the sides and roof are not utilized, as the material remains in a fixed position, that furthest removed from the heat requires a much longer period to be brought to the desired temperature and the more exposed pieces are likely to be overheated, others insufficiently heated and a much longer time required.

Tests of material being heated and hardened in the internally fired rotary furnace at the rate of 2000 lb. per hour have failed to show the slightest variation; with a pyrometer to insure the proper temperature and the chamber tilted to feed at the proper speed the product must be absolutely uniform.

In operation the pieces are fed continuously into one end of the cylinder. The furnace is fired internally from the opposite end, with the zone of highest temperature at the discharge end. The cylinder revolves slowly (1 to 4 rev. per min.) and owing to the slight inclination of the furnace the pieces treated fall slightly forward at each revolution, gradually progressing toward the dis-

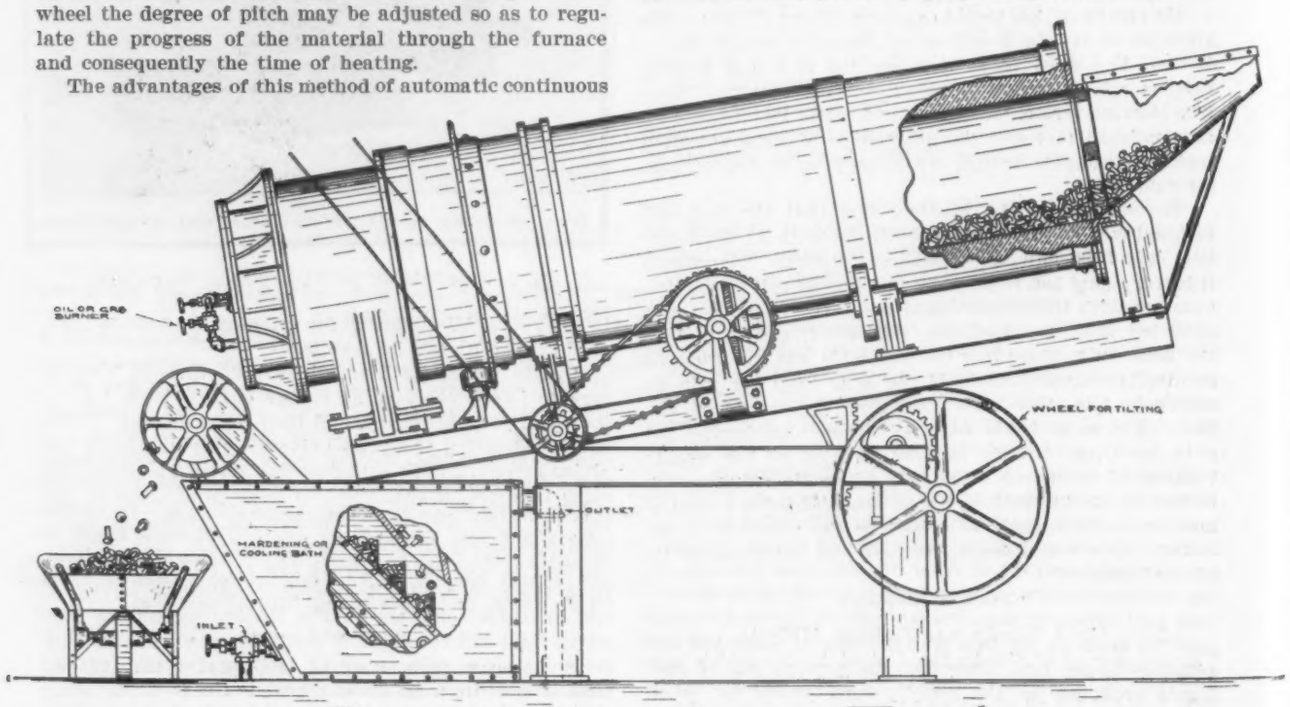


Fig. 2.—The Adjustable Inclinable Type with Plain Lining.

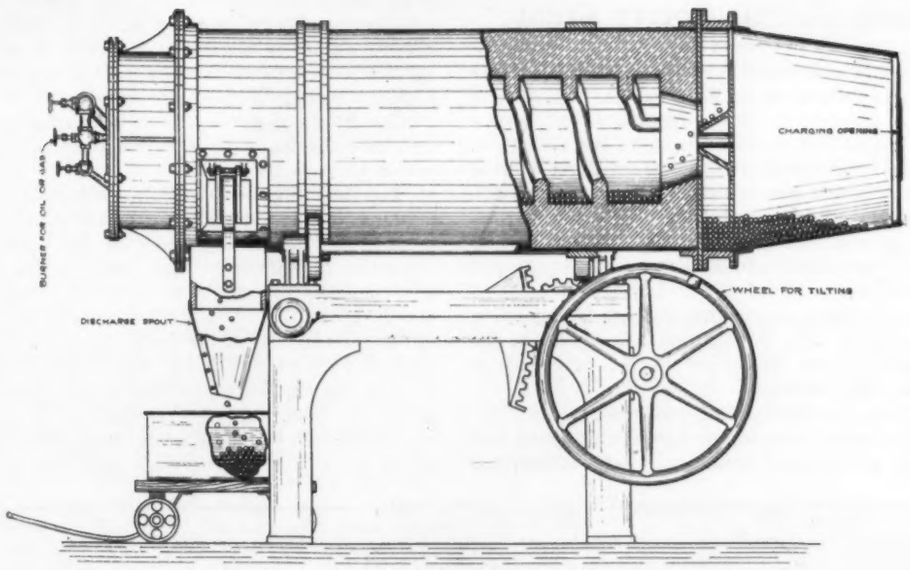


Fig. 3.—A Similar But Smaller Furnace with Helical Lining.

charge end, where they enter a proper receptacle or bath upon reaching the desired temperature. To prevent oxidation the end of the discharge spout may be carried beneath the level of the bath, thereby sealing it and excluding the air.

By this method clogging or retarding of the work is avoided, as there are no corners or pockets in which the pieces can lodge. Wear of the lining is reduced to a minimum and does not require renewal until the greater portion of the brick is worn away. In certain classes of work, such as balls, nuts and uniform shapes, the helical or worm type is used as in Fig. 3, if preferred, but where the smooth lining can be used the cost is less and a greater life is insured.

Oil or gas fuel may be used and perfectly uniform results obtained, as the work treated is heated gradually with every portion of its surface exposed to the direct action of the hot gases and lining, and both temperature and time are maintained constant.

These furnaces are built to suit a wide range of requirements, and in sizes at present that will handle up to 2000 lb. of stock per hour.

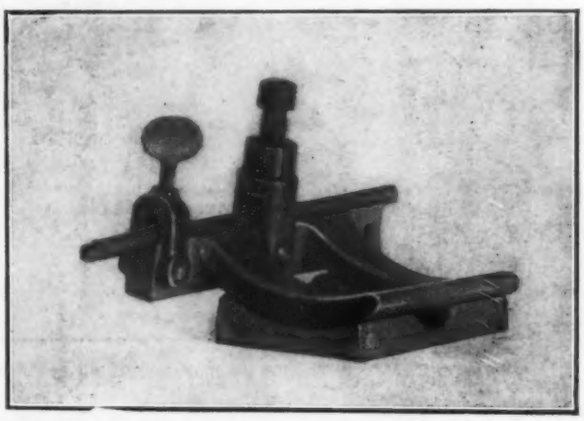
The Cost of Steel by the Lash Direct Process.

The paper of Francis A. J. Fitz Gerald on the "Application of the Lash Process to the Electric Furnace," as read at the Niagara Falls meeting of the American Electrochemical Society, May 6, 1909, appeared in *The Iron Age* of May 13. In the 1909 *Transactions* of the society, just published, the following interesting comment appears, communicated by H. W. Lash, the inventor of the process:

The average saving by the use of hot metal in the manufacture of open hearth steel is about 50 cents per ton. The total cost of refining, in the basic open hearth furnace, liquid pig iron taken direct from the blast furnace or mixer and converting it into steel ingots, is about $3.50 per ton. In using the Lash process two-thirds of the steel bath is produced direct from the ore with no greater power consumption and labor cost than that required for the production of pig iron in the electric furnace. The other one-third of the bath is produced from granulated pig iron, which is mixed with the ore for the purpose of acting as a solvent in presenting the free carbon in the mixture to the oxide of iron, and thereby making possible rapid and economical reduction of the latter. This would make two-thirds of the steel bath—the part produced direct from the ore—cost the same as the electric furnace produced pig iron, while one-third—that part produced from the granulated pig iron—would cost the same as pig iron plus the cost of remelting and refining—$4 per ton. Therefore the average cost of steel ingots produced by the Lash process would be, when using granulated pig iron, $2.17 per ton less than steel made from liquid pig iron, and, should cast iron borings (which are procurable in greater or less quantities in every iron and steel working district) be substituted for, say, one-half of the pig iron in the mixture, it would lower the cost of the steel ingot to practically that of the pig iron made in the electric reduction furnace.

The Robinson Boring Tool Holder.

A universal boring tool holder for use in lathes has been brought out by the Robinson Tool Works, Waterbury, Conn. The device is designed exclusively for boring tool work and differs from the usual type in that it goes over the tool post instead of through it, and gives when clamped a very rigid grip, the support or bearing



A Universal Boring Tool Holder for Lathes Made by the Robinson Tool Works, Waterbury, Conn.

being about 8 sq. in. The holder elevates the boring bar horizontally, giving clearance.

Tools may be made of any diameter and of any kind of round stock, drill rod or black stock, either of carbon or high speed steel. The holder is made in five sizes. No. 1 takes round stock 1-16 to 7-16 in. and is intended for bench lathes; No. 2 is for general tool work and light manufacturing, holding cutters up to ½ in. in diameter. No. 3 is for heavy work and is suitable for use in lathes of 16 to 24 in. swing. It carries a 1-in. boring bar, which may be supplied with either high speed or ordinary steel cutters. No. 4 is built along similar lines, but is still heavier, being designed for lathes of 20 to 36 in. swing, and takes boring bars up to 1¼ in.

A dispatch from Reading, Pa., states that 175,000 tons of iron ore from Sweden have begun to be delivered in Philadelphia for eastern Pennsylvania furnaces.

A German Electric Rotary Crane.

The electrically operated rotary crane illustrated was constructed recently by Ludwig Stuckenholz, Ltd., Wetter on the Ruhr, Germany. It has a capacity of 10 tons, a maximum radius of action of 54 ft., and a lift of 62½ ft.

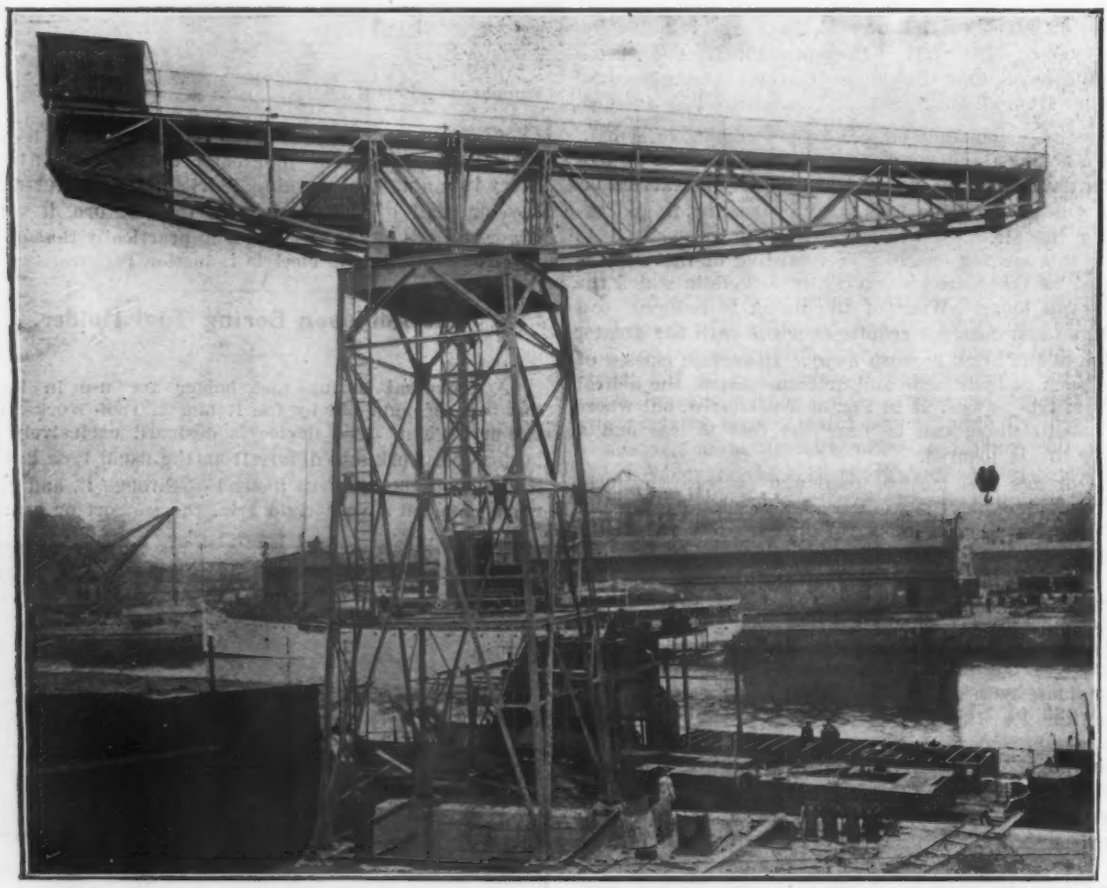
All the crane movements are driven by direct current 220-volt motors, which are controlled from the driver's cabin. The lifting motor is of 36-hp. capacity and runs at 510 rev. per min. The lifting speed with a load of 10 tons is 39 ft. per minute, and with 4 tons 98½ ft. per minute. The motor used for the trolley traveling is of 16 hp. and runs at 880 rev. per min., giving a trolley speed of 82 ft. per minute. The slewing motor is similar to the former and swings the outer end of the bridge at a speed of 295 ft. per minute.

The crane pillar is substantially anchored to its foundations, and the part containing the driving gears and counterweights is arranged to rotate on the pillar; the driver's stand, located inside the pillar, rotates with the bridge.

The cantilever and pillar are well cross braced in all directions. The former is made up of two main girder walls on the upper flanges of which the trolley travels. The lateral cross bracing is effected in the upper and lower flanges by lateral diagonal ties connecting with the corresponding flanges of the runaway girders. On its back extension the cantilever carries a counterweight which is of such a weight that the tilting moment with respect to the front roller when the crane is loaded is about the same with as that with respect to the back roller without load, so that in neither case can any tilting occur. The counterweight is sand and pig iron, small shot and other cheap material contained in a plate iron box.

The pillar is designed gantry-like in its lower part, leaving the bottom open, so that cars can pass through. At the top is a substantial grating, which, on its upper surface, carries a circular rail, and concentric with the latter is a toothed ring of cast steel. At the center of the grating is a rosette, in which the forged steel main pivot turns, serving to center the rotary part, which is substantially fitted into the frame. From this pivot by a light frame is suspended the driver's cabin, which is guided in the same manner as the central pivot, in a platform arranged above the gantry. The guiding pivot carries at its upper end a double ring sliding contact, and, like the main pivot, is hollow to allow the current cables to pass through.

The hoisting mechanism is all spur geared and is mounted on the extreme rear of the counterweight cantilever, so as to serve as part of the counterweight. It comprises the motor, two intermediate gears, and a drum with grooves for the hoisting cable. The load is suspended from four cable strands, two of which are wound up simultaneously on the drum. A brake on the winding gear engages automatically when the current is cut off, holding the load safely at any hight; the load is thereby prevented from dropping if the current supply should be interrupted. A speed gear, actuated from the driver's stand through a lever system, has been provided for allowing smaller loads (up to five tons) to be lifted at a higher speed. The hook turns on steel balls, fitted into the housing of the lower flange. The cable has a factor of safety of eight, and the drum and cable rollers have a minimum diameter equal to 20 times the cable diameter. The trolley is traveled by a cable operated by a drum driven through intermediate gears by the motor. The cable is arranged so that one line is wound up while the other is unwound, making the trolley travel positive in either direction.



An Electric 10-Ton Rotary Pier Crane Built by Ludwig Stuckenholz, Ltd., Wetter-on-the-Ruhr, Germany.

The rotary part of the crane is supported on the circular rail at the head of the pillar by eight cast steel rollers. The slewing gear consists of a motor which through worm gearing drives a pinion working in the toothed ring concentric with the rail.

The driver's cabin is lined with wood throughout; its floor is covered with heavy wooden planks, and its roof consists of thin galvanized iron sheets. Large windows give ample natural illumination in the cabin and allow the driver to see all parts of the space covered by the crane. This cabin contains the controlling apparatus of all of the motors, and a switchboard on which the meas-

uring, switching and protecting devices are mounted. The interior of the cabin is lighted at night by an incandescent lamp fixed to the switchboard. Current is supplied to the crane through an underground cable and to the rotary part of the crane through the sliding contact above mentioned. All the motors are inclosed, so as to be impervious to dust and spray.

All parts of the crane, including the machinery and the structure, are made from selected material, and special attention was taken to providing abundant and effective lubrication and easy access, especially to those parts which are submitted to wear and tear. All gears, brake drums, rollers and other parts submitted to heavy loads are of cast steel, and all bearings, drums, cable rollers and such parts as are submitted to smaller loads of cast iron. All high speed gears are machine cut to insure quiet operation. The bearings are provided with bushes, and all the pinions and shafts, as well as the worm of the slewing gear, are of wrought steel, and the rim of the worm wheel of phosphor bronze. The worm gearing of the slewing gear is mounted in a cast iron box and runs in oil. The axial thrust of the worm is taken by a ball bearing on the end of the worm shaft. The worm, also, runs in oil, and after removing the covering hood is accessible from all sides without unmounting any further parts.

The American Society of Engineering Contractors.

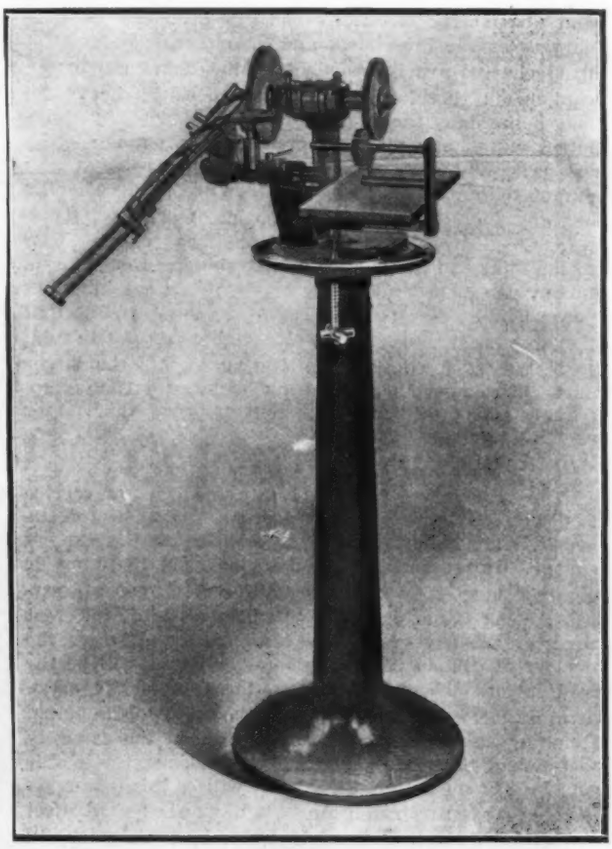
The first convention of the recently organized American Society of Engineering Contractors will be held in Chicago, February 24, 25 and 26, 1910. The place has been selected because it is geographically central for the bulk of the members, and the time because the third annual Cement Show will be in progress then at that city, which will be of considerable interest to those attending the convention. The Committee on Arrangements consists of Willard D. Lockwood, chairman; Daniel J. Hauer, both of New York, and E. S. Hanson of Chicago. The Committee on Entertainment consists of E. S. Hanson, chairman; Ernest McCullogh, and John B. Coleman, all of Chicago. The Committee on Publication is arranging for some interesting papers on concrete to be presented at this convention. At the same time there will be held a meeting of the Illinois Society of Municipal Contractors, which it is hoped ultimately to consolidate with the American Society of Engineering Contractors.

The regular monthly meetings of the society will commence in November, and the first annual meeting will be held in New York in January, 1910. The following committees have been appointed to report at the annual meeting: Committee on Uniform Contracts: John Cassan Wait, engineer and attorney, chairman, New York; George Story, city engineer, California, and J. E. Warner, highway engineer, Missouri. Committee on Uniform Specifications: W. R. Harris, contractor, Kentucky, chairman; Carl Weber, contractor, Chicago, Ill.; R. B. de Corriveau, Board of Public Works, Canada, and J. H. Bacon, railroad engineer, Canada. Committee on Uniform Cost Keeping and Cost Analysis: Gustav Kaufman, contractors' engineer, New York, chairman; J. F. Mooney, contractors' engineer, Pennsylvania; B. M. Langhead, railroad engineer, North Carolina; DeWitt V. Moore, contractor, Indiana, and L. H. Krebs, city engineer, Utah. Copies of contracts, specification or blanks for cost keeping for the use of these committees are invited and should be addressed to the secretary, Daniel J. Hauer, Park Row Building, New York City.

A Model Pennsylvania Road.—A local paper praises the Hummelstown pike, near Harrisburg, Pa. It is surfaced with a mixture of water gas tar, cement, liquid asphaltum, road oil, carbolic disinfecting powder, sulphate of copper, and oil of wintergreen. The sulphate of copper is used to prevent the oils from becoming ignited, and the wintergreen counteracts the odor of the others. A curious effect of the mixture is its disinfecting power. During the past year there was not a single contagious disease in that section. The cost of applying the mixture is 5½ cents a square yard. The cement holds the dirt together like stone, and the oils make it waterproof, so that it readily sheds water. The road is never muddy, and, unlike a tar road, does not become slippery in winter time. Frost has no effect on it, as the mixture will not freeze. The cost of applying is very small, as it is sprinkled on like water. Despite the heavy automobile and wagon traffic, the road is perfectly smooth and very hard, and it has met with tests in every way.

The Robinson Grinder.

The grinder shown in the illustration was designed primarily for surfacing small dies and punches or small parts on tool work, but it is also equipped with a fixture which holds milling machine cutters for grinding, and another for grinding twist drills, together with an adjustable rest for general tool grinding, so that it constitutes a very convenient tool for tool room or press room. It is built by the Robinson Tool Works, Waterbury, Conn.



A New Combination Grinder Built by the Robinson Tool Works, Waterbury, Conn.

The platen for surface grinding is adjustable for height, the greatest capacity under the wheel being 4½ in., and there is a screw feed. It is stated that the grinder will not burn the die, but leaves it very smooth, resulting in a longer life. Attached to the platen is the fixture for grinding milling machine cutters. The twist drill holder taking drills from ⅛ to 1½ in. diameter, which can be ground theoretically correct, the clearance varying in correct ratio to the size.

The arbor is steel running in bronze bearings which are provided with adjustments for wear for both end thrust and side shake, making it possible to have at all times a smooth running wheel arbor, a necessary condition in doing fine work. The height of the machine on a column is 46 in., diameter of drill grinder wheel 6 in., of surface grinder wheel 5 in., and the net weight 180 lb. The machine is also furnished as a bench surface grinder.

The Centralization of Electric Power Supply.*

Economies to Producer and Consumer.

BY LOUIS A. FERGUSON.

In the industry of electric power production the advantages of centralization seem thus far to have failed somewhat of full appreciation, but the awakening is apparently at hand. In a few noteworthy instances centralization was planned and put into effect some years ago, and the work already done will blaze the way for others. When the economies of concentrated management and large production are more generally understood the growth of centralization will be rapid. The load factor of central stations—that is, the ratio of the average load to the maximum load, absolutely controls the earning capacity of the investment. The cost of generating and distributing electricity consists primarily of fixed charges on the investment and of operating costs. The fixed charges are independent of the hours use of the equipment; therefore, if the load continues heavy for long hours daily the fixed charges are distributed over a larger output and the cost per unit of output is thereby lessened. In others words, with long hours use a greater output follows, and greater earnings are produced without any increase in the investment. Obviously, therefore, the greater the proportion the fixed charges bear to the total cost the greater will be the effect of the load factor. In modern large power systems, as in water power plants, the operating costs are now so low that they represent a comparatively small part of the total costs, the fixed charges constituting by far the larger part. The importance of a good load factor is thus apparent, and everything that will improve this factor should be sought.

Combining Various Classes of Service.

The yearly load factor for any one class of service is determined largely by the seasons, the habits of the people, and similar conditions which ordinarily do not change. Improvement in load factor must therefore be obtained largely by combining different classes of service, the maximum demands of which occur at different times of the day or of the year. Also, the larger the number of customers in any class the better will be the load factor. The ratio between the sum of the maximum demands of various classes of service to the actual simultaneous maximum demand is termed the diversity factor, and the more noncoincident peak service that is combined in one system the greater will be this factor. It is here that centralization presents its most marked effect in increasing the load factor and thereby the economy of production. The whole community through this reduction in cost is thus benefited by centralization, since the central station company is enabled to sell its product at a lower price to the small consumer because of the improved condition of manufacture effected through the supply of its product to the large consumer.

In the power station the larger output of combined loads will permit the use of large generating units which have a high performance efficiency, and which require a comparatively small operating force. This results in further reduction of costs. The investment per kilowatt, not only for the apparatus, but for the land and building as well, is also less for large units, and the total reserve required by the centralized system will be but a small fraction of the combined reserve required where the load is furnished from individual systems. The saving in investment in this single item of reserve alone is an important factor in the problem.

Standardizing Equipment.

One of the leading causes for the success which has attended the development of the electrical industry in this country has been the standardization of equipment. It is still a far cry to the ideal, but all steps taken should be in the forward direction. Centralization leads toward standardization. In the present state of the art, generation will be by three-phase alternating current and the predominating demand will determine the frequency, be it 25 or 60 cycles or some other frequency. If, however, the demand in any community for an auxiliary standard frequency becomes sufficiently large, even though it remain a small part of the total output, then generation at this auxiliary frequency is justified; but connecting links of ample capacity should be provided between the sets of generators of different frequency so that the advantages of the diversity factor and of common reserve may still obtain. The voltage should also be so chosen that the transmission cable may be interchangeable between the two systems. An incidental advantage of centralization, which, however, is of great sociologic importance in a community, is the resultant cleanliness due to the absence of countless smoking chimneys. This fact is being actively recognized by civic improvement bodies, and such recognition is a valuable asset to a central station company in the prosection of its industrial power campaign.

Centralization in England and the United States.

One of the early and prominent examples of centralization is found in England where the Newcastle-upon-Tyne Electric Supply Company furnishes energy to one of the most important manufacturing areas in the United Kingdom. A special effort has here been made to develop particularly the industrial power business and the general adoption of electricity has had a marked effect on the industrial conditions in that district. The tramways are operated from this system as well as electrified steam roads. In many of the smelting works the waste gases are used to produce steam in boilers, and the energy thus derived is used in turbine stations and is fed into the general system, the same smelting companies being, in turn, customers of the supply company. The total load is not so very large compared with that in some of our American cities, but this system is mentioned in such detail because it typifies what can be done in the way of centralization. There is still a good deal of independently produced power in the district, but it will undoubtedly eventually be won over by the supply company. Even though the difference in efficiency between the smaller turbine units and the larger units is decreasing, the diversity factor will, in most cases, enable the supply company to underbid independent producers.

In some American cities, as already stated, the total load is considerably greater than in the example just cited, but the centralization possibilities are only just beginning to be developed. The system of the Pacific Gas & Electric Company with its hundreds of miles of transmission lines, its many customers among the mines dotting the hills, and the many cities receiving electrical power from the company, is perhaps the nearest approach to the Newcastle system. At Niagara the transmission lines are reaching out in all directions, and we may hope to see one of the great industrial centers of the future in that locality. At the present time there are many independent companies, and the full benefits of centralization will not be realized until the stations are loaded up to the point where they will be compelled to arrange for interchange of energy.

Chicago, because of its strategic location regarding transportation, is certain to remain one of the world's greatest markets and industrial centers. The possibilities in power requirements of the future in the Chicago districts would appear almost boundless. A vigorous start toward centralization of power production has already been made. Street railroad power houses have been shut down and the energy for the operation of the street railroads is purchased in whole or in part from the central station company.

Industrial Demand for Electric Power.

The supply of power for electrified steam railroads is one of the possibilities of the near future and engineering plans and expenditures of past years have been made with a view of taking care of wholesale industrial business on a comprehensive scale. In a large number of cities two prominent public services—street railroads and electric lighting—were originally inaugurated by

* From the presidential address at the annual convention of the American Institute of Electrical Engineers, Frontenac, N. Y., June, 1909.

one company, and with the natural growth and development of the two systems the electrical generation has in many cases been unified, so that one set of generators furnishes energy for both railroad and lighting. However, in most of these cities the industrial power business has not been vigorously developed, either because of lack of appreciation of its value or timidity on the part of the supply company in making sufficiently low prices to obtain the business. There are also very few, if any, communities or territories in which the centralization of power supply for all purposes has been effected and in which electric power is utilized in such manner that the best economic results are realized. By combining all systems of neighboring cities within a radius of 30 or 40 miles into a single centralized system a great saving in production would result and in most cases an improvement in service as well. The utilization of water powers will help in this direction.

The monopolistic character of the electric power industry is now being recognized by the intelligent public and monopoly privileges with proper regulation are being granted as the best safeguard for the interests of the people. The legal way is thus being paved for the beginning of centralization. Such centralization will naturally include the power for electrified steam railroads, the universal coming of which is but a matter of time. In most instances the total amount of power required by a railroad for its terminal and suburban service, even where counted in the tens of thousands of kilowatts, is but a small part of the total power required for all purposes within the same area.

If this railroad power is generated in a separate plant the load factor would be far below that of the central station, and the necessary reserve capacity would require a high fixed charge to be carried by the plant. With less reserve the reliability of the service might suffer disastrously. No railroad could thus generate its own power as cheaply or as securely as it may be purchased from a properly directed central station company. This applies also and to an even greater extent to power production for industrial uses or to individual generation for any purpose.

In cities where the power production is not centralized a multiplicity of systems of voltages and often of frequencies is usually found, and the duplication which spells waste is abundant. Without the economies resulting from centralization the price of the output will necessarily remain higher than otherwise and the community must pay the cost. With the lower efficiency of generation the fuel resources are wasted and the entire country will ultimately suffer as a result. There is scarcely any branch of the electrical industry which does not ultimately affect or which is not in a measure affected by this development.

The Work of the Electrical Engineer.

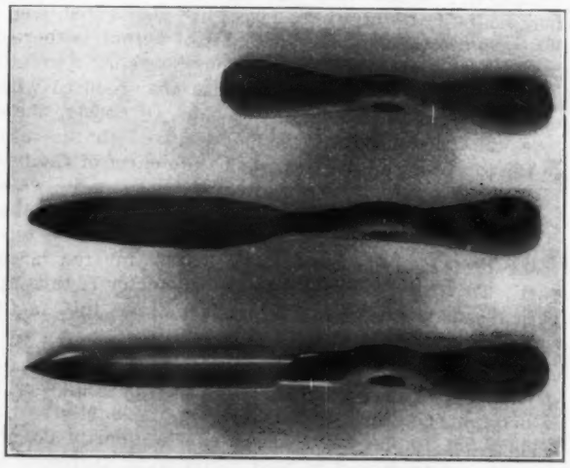
The progressive work of the electrical engineer will determine with what success we can reach out into these larger fields. The mechanical engineer has given us a steam turbine of greatly improved economy; it is for us to improve still more the method of transmission and conversion and the application of electricity in the arts. High voltage transmission made possible our entry into this field, but, while very great advances have been made, there are still some unsolved problems in this field, and particularly with regard to underground transmission. There are also many problems and countless opportunities in connection with the utilization of electrical energy. The successful solution of these problems is of the utmost importance.

It is for the commercial electrical engineer (which really includes nearly all of us) to educate the layman, and particularly the power user to an appreciation of the superiority and desirability of electric service, and to emphasize the material and ethical advantages to a community of centralized power production. It is for the technical electrical engineer to furnish him with the sinews of war, with the ammunition to conquer in the fields where waste of energy prevails. We should bend every effort to advance the cause of centralization with its resultant economic gains. Those connected with the manufacturing interests especially should not tolerate for an instant a selfish backward step within their fold.

Steiro Castings.

In the practice of the Columbus Malleable Casting Company, Columbus, Ohio, a product has been developed to which the name Steiro has been given, in view of the use of a certain percentage of steel in the mixture. So-called semisteel castings have been produced by a number of foundries in recent years, and there has been an occasional instance in which malleable practice has been employed in the production of castings marketed as "steel." However, the castings shown in the illustration are referred to as the straight product of the malleable foundry. A reverberatory furnace is used for melting and the annealing is the same as that of other castings, though special attention is given to the operation in that department.

The result of the use of steel in the mixture and of the heat treatment given the castings is a product strong, close grained and ductile, and capable, it is claimed, of the service for which steel castings would be employed in some instances. In the illustration three stages of a trace chain key are shown. The second piece is the result of hammering out the casting on an anvil. In the third case the hammered piece has been machined and polished, having much the appearance of steel.



Steiro Castings.—Various Forms of a Trace Chain Key.

The Production of Forgings in 1908.—One means of measuring the falling off in railroad purchases of iron and steel last year is afforded in the American Iron and Steel Association's statistics of forged products, just published. The production of forged iron and steel car and locomotive axles, shafting, anchors, armor plate, &c., by the rolling mills and steel works of the United States in 1908 amounted to 131,143 gross tons, of which about 13,646 tons was iron and about 117,497 tons steel. In 1907 the production of forged products by rolling mills and steel works amounted to 380,805 tons, of which about 23,772 tons was iron and about 357,033 tons steel, while in 1906 the production of forged products was 352,636 tons, of which about 19,148 tons was iron and about 333,488 tons steel.

The Buffalo Union Furnace Company is arranging to equip its furnaces on the Buffalo River at Katherine street, Buffalo, N. Y., with a pig casting machine for the manufacture of basic iron. Plans have been completed, but the contracts have not yet been let. This company also contemplates equipping the new furnaces to be erected on the Niagara River, just north of the city line of Buffalo, for the production of basic iron, in addition to malleable, Bessemer and foundry irons. Plans for the two new furnaces to be erected there are in progress and construction work will be started early next spring.

The Hoisting Plant at Ensley Blast Furnace No. 3.

In the reconstruction of the No. 3 blast furnace of the Tennessee Coal, Iron & Railroad Company's Ensley, Ala., group, an electrically driven skip hoist engine of the Lidgerwood Mfg. Company type was installed. The general features of this hoist have already been described in these columns.* Prominent among them is an arrangement for quickly separating the frame of the motor when it is necessary to replace the armature or any of the field coils. The installation at Ensley, which has been in operation for some weeks, has a number of features of its own which make an illustration and description of interest.

The hoisting engine has two drums placed 7 ft. center to center, 66 in. in diameter and 36 in. between flanges. The bodies of the drums are grooved for two parallel steel cables 1⅛ in. in diameter. The drums are accurately balanced and are bolted to a drum gear which is located centrally between them. The drums are so grooved as to give the width of two spaces between the cables at all times, thus eliminating the possibility of chafing. The hoist is supplied with two solenoid brakes, either of which is capable of holding safely the maximum load, so that if it should be necessary at any time to repair or replace either brake the operation of the hoisting will not be interfered with. The main solenoid brake

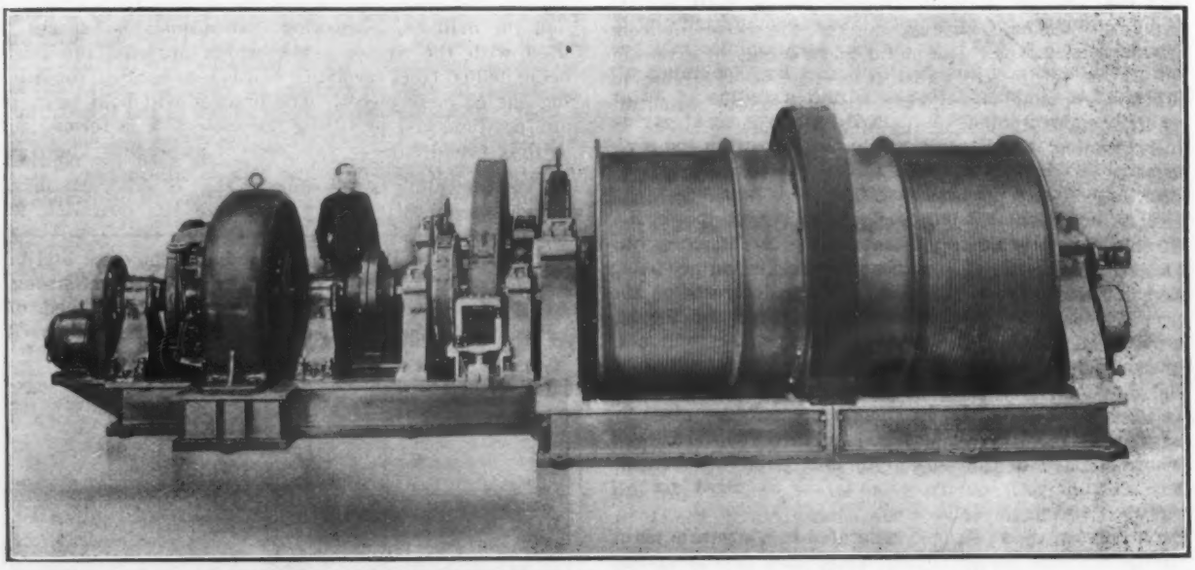


Fig. 1.—The New Double Drum Lidgerwood Hoist at Blast Furnace No. 3, Ensley, Ala.

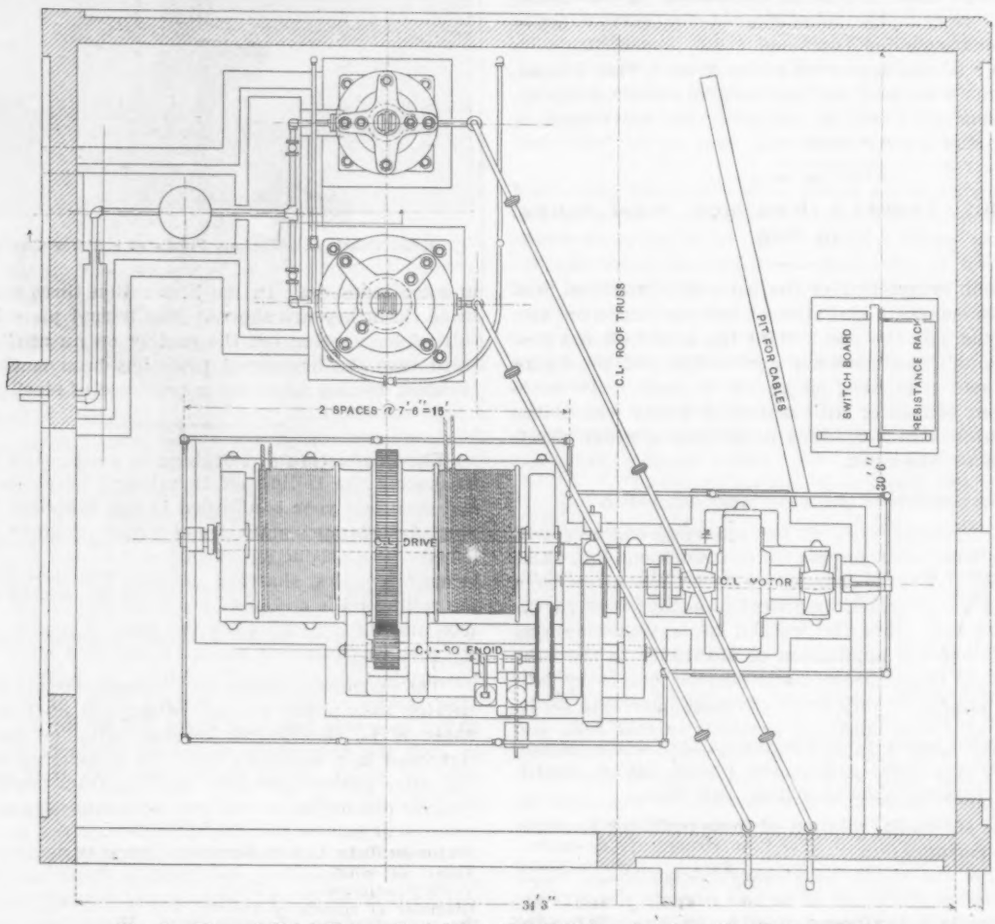


Fig. 2.—Plan of Hoist House, Containing Also Cylinders for Operating Furnace Bells.

* *The Iron Age*, January 2, 1908, page 40.

wheel is attached to the intermediate shaft, which revolves at one-quarter the speed of the armature shaft, thereby reducing the wear on the brake blocks and prolonging the life of the brakes. The gears are all inclosed or protected either by tight gear cases or the usual form of wrought iron guards. The shafts being arranged on the same level, one can be removed without disturbing either of the others. The hoist is operated by a direct current 130 hp. six-pole 240-volt motor, built by the Crocker-Wheeler Company, and of the reversing compound wound type. The motor has a standard extension of the armature shaft and is coupled to the hoist by flexible coupling, permitting changes of the armature shaft without disturbing any other part of the hoist.

A double skip hoist incline is employed, the inclination being 55 degrees. The skip car travel is 190 ft. The hoist has a capacity for raising 100 tons of stock per hour, the maximum load of the skip cars being 10,000 lb. and the average number of trips being 45 per hour. The pig iron capacity of the furnace is put at 450 tons a day.

Automatic control, limiting the travel of the carriage at both top and bottom of the hoist incline, is provided in the improved Baehr disk. It is so constructed that the speed of the skip at the slow down is exactly the same regardless of the load, and the hoist is brought to a stop at a predetermined point for dumping the load. The control panel consists of the latest type of switches manufactured by the Cutler-Hammer Mfg. Company. As seen at the left of the view of the hoist given in Fig. 1, an auxiliary generator is provided for control in this installation, whereas usually the main current is employed. Another special provision is a series of slack rope switches. In case the hoisting cable should slack for any reason it would touch one of these switches, throwing on current and applying the brake.

Fig. 2 is a plan view of the hoist house. The cylinders shown are those used for operating the bells at the top of the furnace. They are located in the hoist house in order to give a practically clear top.

Allegheny County's Iron and Steel Output in 1908.

A recent compilation of the American Iron and Steel Association presents statistics of the production in Allegheny County, Pa., of the various forms of iron and steel in 1908 and a comparison with 1907. The number of blast furnaces built and building was 47 in both years, while the number of rolling mills and steel works was 64 last year, against 66 in 1907. The production in gross tons in various lines was as follows. Rolled forging blooms and billets are included under "rolled products":

	1908.	1907.
Pig iron	3,917,938	5,438,233
Bessemer steel	1,361,895	2,972,286
Open hearth steel	3,106,797	3,883,014
All other steel	20,764	50,290
Total steel	4,489,456	6,905,590
All kinds of rails	269,735	770,333
Structural shapes	463,761	889,066
Plates and sheets	715,164	1,346,517
Other rolled products	1,410,586	2,632,314
All rolled products	2,859,246	5,638,230

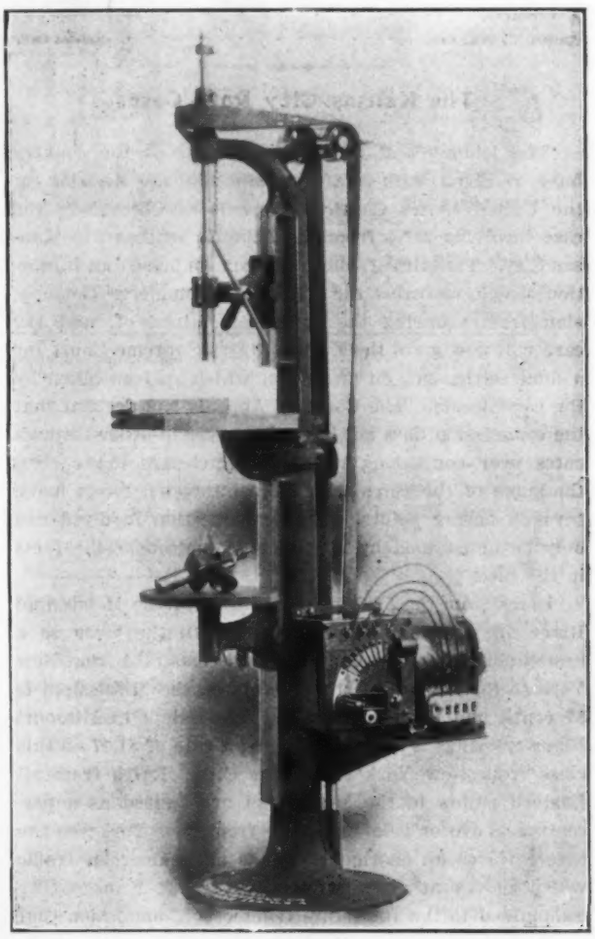
The table below gives the percentage of the production of Pennsylvania and of the United States contributed by Allegheny County in 1908 and 1907:

	Percentage of Pennsylvania total.		Percentage of total for United States.	
	1908.	1907.	1908.	1907.
Pig iron	56	47.9	24.5	21.1
Bessemer ingots and castings	64.6	68.2	22.2	25.4
Open hearth ingots and castings	58.3	49.3	39.6	33.6
Total steel ingots and castings	60.1	56.1	32	29.5
Rails	54.7	68.1	14	21.1
Structural shapes	57.2	60.9	42.8	45.8
Plates and sheets	46.7	50.7	26.9	31.6
All finished rolled iron and steel	50.9	55.9	24.1	28.3

It will be seen that last year Allegheny County fell below its percentage for 1907 in all finished forms, as well as in Bessemer ingots, while it exceeded the percentage of 1907 in pig iron and open hearth steel ingots.

A Rockford Motor-Driven Sensitive Drill.

Rigidity, strength, and an increase in the amount of work ordinarily done on this type of tool are the claims made for the No. 5-B—14 in. sensitive drill made by the Rockford Machine & Shuttle Company, 1045 Seminary Street, Rockford, Ill. The spindle is fitted with a take up collar to compensate for wear and back lash of the spindle and sleeve, and keeps the spindle from dropping and the drill from breaking. An adjustable bracket is used with the square table, which prevents the piece being drilled from revolving, and is also a gauge for drilling one or more pieces. The bracket will hold work in any position, and by tilting the table a *V* is formed for drilling round bars or any piece at an angle. The combination centering fork and cup is all in one. It is regulated with an index pin, and there is no chance of losing any parts as it is always together and always ready for use.



The No. 5-B 14-In. Motor Driven Sensitive Drill Made by the Rockford Machine & Shuttle Company, Rockford, Ill.

The machine is driven by a variable speed motor. The driving cone pulley has an adjustment of 3 in., so that there is no occasion to shorten belts as they can be tightened in a moment's time. A supporting bracket on the idler pulleys prevents the belt from slipping. The general dimensions of the No. 5 machine are as follows:

Distance of post to center of spindle	7 in.
Maximum distance from spindle to round table	41 in.
Travel of spindle	5½ in.
Vertical adjustment of head	9 in.
Diameter of spindle in sleeve	⅞ in.
Hole in spindle, Morse taper	No. 2
Driving pulley on countershaft	8 x 2⅛ in.
Speed for countershaft	450 rev. per min.

Although the Youngstown Sheet & Tube Company, Youngstown, Ohio, when it completes its third blast furnace, now under construction, will have a capacity for making 1500 tons of pig iron per day, it will still buy considerable iron in the open market, as it is melting at present over 2000 tons of Bessemer iron every 24 hr.

THE IRON AGE

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The Kansas City Rate Case.

The jobbing and wholesale interests of the country have received with great satisfaction the decision of the United States Court of Appeals at Chicago in the case involving rates from the Atlantic seaboard to Kansas City. Technically, the court has confirmed an injunction which restrains the Interstate Commerce Commission from reducing the rates complained of, and the case will now go to the United States Supreme Court for a final settlement, on an appeal which will be taken by the commission. The Court of Appeals has decided that the commission does not have the power to order through rates over connecting railroads which are lower than the sums of the rates which the interested roads make through basing points. The real question involved can only be understood by a brief examination of the facts in the case.

Rates from the East to points west of the Mississippi River are made by the railroads with the river as a basing point. For example, the first-class rate from New York to St. Louis and other points on the Mississippi is 87 cents, and the rate from the Mississippi to Missouri River crossings is 60 cents, making a rate of $1.47 on this class from New York to Kansas City. Rates from all Eastern points to the Mississippi are figured as a percentage above or below the rate from New York; so the case involves an enormous volume of commercial traffic which moves at class rates. Jobbers at Kansas City complained to the Interstate Commerce Commission that their rates from New York were excessive and unreasonable, and the commission, after a full hearing of the evidence, ordered that the railroads should make through rates on the basis of a reduction of 8 cents in the first-class rate. A similar reduction was ordered in rates to Denver on complaint of Denver shippers. If the commission had merely held these rates unreasonable it is doubtful whether the courts could interfere with the reductions that were ordered, but in its decision the commission undertook to lay down a broad rule that on all long haul traffic of this character a through rate should be less than the sums of the local rates through an intermediate point.

This proposed broad rule struck at the foundation of all the wholesale or jobbing traffic of the United States. If carried out to its logical conclusion, it would make lower rates to every inland town, from the seaboard or from factories, than the rates that would be legal through jobbing centers. The jobbers would thus be placed under a heavy handicap in serving the merchants in his territory. The merchant would have lower rates from the factory or from the seaboard, and would thus have an advantage in buying direct from the factory or from the importer. The rule now followed almost universally in railroad tariffs makes the cost of freight the same to an inland town, whether a shipment goes direct from the factory or stops at a jobbing center. On bulky goods the jobber can make a saving by purchasing from the factory in carloads, but there are many articles of retail trade on which the railroads do not make carload rates. The custom of making the large jobbing centers basing points for rates has existed from the very beginning of railroad traffic in the United States, and the Court of Appeals has decided that the commission does not have the power to overturn the established commercial geography of the country.

This method of making rates arose in a very natural manner. The first important railroads were projected from the seaboard to Lake Erie or the Ohio River, and created terminal jobbing centers at points like Buffalo and Pittsburgh. Other railroads were then built by separate companies to Chicago and to St. Louis and other points on the Mississippi, creating similar terminal points and jobbing centers. In due time many of these latter roads were merged in or purchased by the trunk lines, but no Eastern railroad has ever crossed the Mississippi. The granger roads were projected from Chicago to the Twin Cities and points on the Missouri River, creating similar terminal points. In time they built lines through the Northwest and beyond the Missouri, but maintained their original terminals as basing points for rates. Meantime, scores of intermediate cities and towns had become terminal points for railroads of more or less importance, and had shared to a great extent in the general policy of making a terminal city a basing point for rates to territory beyond. The growth of these cities depended chiefly upon the number of railroads which made them terminal points, Kansas City becoming in this manner a larger commercial center than Wichita or Topeka, and outranking St. Joseph, the first city on the Missouri that had a railroad from the East. When the Kansas City jobbers won their case before the commission they found that they had literally caught a bear by the tail, as the rule laid down by the commission, if applied to rates beyond Kansas City, would offer inducements to the merchants in every little town in Kansas to buy their goods in the East and obtain lower through rates.

The Latent Demand for Machinery.

In considering the machine tool situation, and in fact that of all classes of metal working equipment, many manufacturers, both buyers and builders, fail to realize the existence of what has been aptly termed the latent demand which grows continuously during dull times and which must be cared for with returning prosperity. Business was flat and there was little tangible evidence upon which to base encouragement during much of the years 1907 and 1908. But all this time a demand was storing up in excess of anything that had preceded it; an additional buying power was being created, due to the material growth in the population and wealth of the country which nothing could check, combined with new conditions which must mean heavy requirements of machinery. This power will be felt presently and will be largely responsible for bringing the curve of the machine tool business higher even than it was two years ago. Therefore, in considering producing capacity, if the manufacturer wishes to plan to make the most of a full market, his calculations must be based not only upon a com-

parison with the last two years, but he must also figure upon the maximum of the last high wave. Two years of growth in population, of new wealth created by bountiful crops and by products of the mines and other natural resources, have also seen the development of great industries, which latter factor seems always to enter into the latent increase during a time of stagnation. In this case the automobile is the predominating influence. At a previous time it was the bicycle. In the fullness following the panic of 1873 the electrical industry developed to become the overwhelming drain on the machinery market when the revival came in 1879.

A careful scrutiny of the machinery market emphasizes the truth of the frequently stated fact that the nation's capacity for producing machine tools is much below the requirements of consumers when they are busy. The trade has not been able to provide for the output that the market would absorb if it were available. If the shops could keep running in dull times as well as in good, to accumulate large stocks, then current production might make an easy market; but it is obvious that this cannot yet be done except by a few individuals. One reason is the lack of capital which would be tied up for long periods, in the semi-speculative belief that substantial returns on the investment would follow later. The trade has not earned the profits to which industrial investment is entitled. A disorganized condition, corrected only during recent years, kept down net earnings and resultant financial resources, so that a great many houses, if they should have wished to do so, were unable to stock up when business was poor and production could be more cheaply accomplished. Nor have some of them expanded as they would have liked. The seriousness of financial handicap has been less pronounced in the past few years, but the old influences have been present to some extent.

Prices will undoubtedly be higher in the near future. Announcements of advances are heard, and reports of others are in the air. The average price, taking a period of years, will be greater, to the ultimate substantial increase of resources and perhaps a more general disposition to accumulate stocks when business is poor. At present the trade believes that it soon will have a difficult and probably impossible task in taking care of the business offered. The metal planer market affords one of the best illustrations of what has resulted from too slow a growth. Few planers have been built in the past two years, excepting on order. There are practically no stocks in hand, except to a limited extent in the smaller sizes. To-day a planer may be had for immediate shipment, but it will take but a small increase in business to wipe out the existing supply, leaving current production as the only resource. Some builders have in their storerooms a limited number of the lighter parts of machines, but the heavier castings, such as the bed and the table, must be manufactured and machined. With the larger sizes months are required from the date of order to the day of shipment, for it takes time in the foundry and good practice is to let castings season before machining. The capacity of the planer builders has not been greatly increased since the days preceding the last prosperous period.

There promises to be something of a scramble on the part of buyers to get in early with their orders. Deliveries of some classes of machine tools are already so far ahead as to look menacing. The buyers who have had occasion to make inquiry concerning certain machines have been taken aback at the deferred deliveries offered them. One large machinery dealer has found himself unable to get more than six machines of one type and size for March delivery, and after that it will be summer before he can increase his stock further. Nothing is available before March. In another size of the same machine only two machines are available for nearly a year. A few inquiries by hesitating buyers will give them a realization of what they may expect if they delay too long.

Time Saving in Shop Operations.

Much as has been written about the various systems urged upon manufacturers in recent times by those who specialize in reduction of cost through increase of output, the question is receiving more and more attention. Something was said in these columns recently of the results obtained in one machine shop by a constant comparison of current costs with those shown for like work in the records of the cost department. A correspondent called attention last week to the fact that such a comparison takes no account of the lowest possible cost, dealing merely with past and present performance. He suggested further that there is often in the performance of work a great and preventable waste of time which no appeal to records will bring out. The management, it is argued by the specialist in intensive production, may not know that the time of certain operations can be materially shortened; the workman also may consider that he is producing up to his capacity, granting that the pace is to be steadily maintained and that mere spurts are not desired. Yet under just such a condition, with just such an attitude of employer and employee, the problem of increasing output has been attacked and marked results have been obtained.

The attempt to restandardize the time for various operations in connection with a new method of determining compensation has its perils. Repeatedly efforts to introduce innovations in wage systems have resulted in friction, ill feeling and an opposition that proved costly. Yet it has been demonstrated that men are willing to work at any reasonable speed in a reasonable way, if properly trained and suitably rewarded. Often has it been shown, in the introduction of new systems, that direct lines of procedure do not yield the largest results. The management that heralds the premium system, the task and bonus system or any other of the plans which are superseding day wages or piece work, by posting a notice and naming a date for the introduction of this new régime, need not be surprised if the response is a general bracing for a conflict. The best policy in the beginning, as in the later operation of the new system, is to move along the line of least resistance—the line of larger returns to the workman.

A method of time saving and cost reduction that has been applied effectively is one involving a time study, not, as in many cases, to demonstrate to the satisfaction of the management that the time used to perform given work can be shortened, but rather to give this information to the workman himself. An instance is cited in which a stop watch was used to time the component operations in plate punching. It was found, for example, that the workman took four times as many seconds for a certain operation in the case of one plate as for the same operation on a preceding plate, or, say, 20 seconds as against 5 seconds. Other variations were noticed in the analysis of the job, the observation extending over several hours. Then the minimum times were added, this total representing the time in which a plate could be punched in the various places called for if the workmen performed each fractional operation in the best time he had made, working in his accustomed way. It was a

surprise to the workman to be told that such inequalities existed in the time he took for simple operations. The proposal was made that if he finished within an hour a certain indicated number of plates—a number which the analysis of his own motions had shown he could finish, with a margin of time left—he would be given a considerable advance over the rate he was receiving. There was no unwillingness to make the attempt, and the increased output that resulted was continuously profitable both to the management and the man.

Another example cited was a riveting operation. The time losses were due to the fact that the riveter, in the position in which he was compelled to stand, with the layout as it existed, was in the way of the passer. There were some holes requiring reaming, also. The procedure had been to try the rivet; withdraw it if the hole required reaming; lay down the air hammer; ream the hole; then insert the rivet and finish the operation. The study of the analyst resulted, first, in making it possible for the passer to cut his time in two. Then 10 holes were tested in series and any reaming required in any of the 10 was done in sequence; finally 10 holes were riveted in succession. The saving in time due to this study was pronounced and the task of the workman, instead of being more difficult, was made easier.

Time saving of the sort resulting from a close study of manual operations is not the application of the spur or the driving of an unwilling worker. It is rather bringing out information not available before and making it serviceable to the worker and his employer. Viewed in that light and followed out with tact, such methods of preventing waste ought to win their way without forcing or friction.

The American Locomotive Company's New Note Issue.

The American Locomotive Company announces that it will issue $5,000,000 5 per cent. gold debenture notes to provide working capital and reimburse its treasury for money expended in improvements. A similar issue was placed in October, 1906, for a like purpose, of which $3,000,000 is still outstanding. The note issue of 1906 was placed without trouble on favorable terms with New York bankers, and it is expected that this one will meet with equal favor. In connection with the issue now announced, the directors made public the following statement:

"In order to take advantage of the prevailing low prices of materials and facility and economy in making improvements when the plants were not in full operation, the directors of the American Locomotive Company, with full belief in the future prosperity of the country, some time ago authorized extensive improvements in the larger works of the company at Schenectady, Dunkirk, Pittsburgh, and Richmond. Plans have been prepared and contracts let for these improvements, which it is expected, will result in a largely increased capacity and reduction in manufacturing costs. The improvements outlined entail an expenditure of $3,500,000 for which it will ultimately be necessary to reimburse the treasury of the company. Accordingly, the directors have authorized an issue of $5,000,000 5 per cent. gold debenture notes to reimburse the treasury for the amount expended in improvements, and to provide additional working capital necessary to conduct the greater volume of business made possible by the increased facilities."

The New Brush Runabout Plant.—The Brush Runabout Company, Detroit, Mich., manufacturer of automobiles, motors and automobile parts, is building a large plant on a site consisting of 19 acres of ground recently acquired for that purpose. The principal structures are as follows: An experimental and repair building 64 x 150 ft., machine shop 150 x 337 ft., paint shop 150 x 208 ft., brass foundry 45 x 170 ft., blacksmith shop, case hardening and tempering building, motor and chassis testing building, power house, building for enameling ovens, pattern vault buildings and office building. The three principal buildings are so arranged as to permit of extension on two sides. The company has ordered approximately $125,000 worth of tools, embracing hand and automatic screw machines, grinders, gear cutters, multiple spindle drills and various special tools designed for the automobile business, which will practically double its present equipment. It expects to occupy the new plant by November 1, and is now getting started on a run of 6000 cars.

The Volume of Railroad Equipment Orders.

The *Railroad Gazette*, in view of the recent statistics of surplus cars and the prediction that at the present rate of decrease a severe car shortage may be faced before October, refers as follows to the orders for new rolling stock:

Although the great demand for cars will be for handling the grain crop, there are signs that all classes of cars will be badly needed. The heavy coal movement should begin about September, and there is now a lot of lumber moving. In Louisiana, for example, roads are hurrying repairs for cars to carry cypress, of which heavy shipments are expected.

We have recorded since the first of June orders for about 47,000 freight and passenger cars. In the whole calendar year 1908 our records showed orders for only 64,000 cars. Since June 1 orders for 400 locomotives have been reported, which compares with orders for 1200 during 1908. Nearly all this equipment will be delivered in time to be a factor in moving traffic this fall. The extent to which it will help the car shortage situation is largely offset, however, by the fact that much of it will, so to speak, have to carry itself. The steel and lumber for this equipment has got to be carried from somewhere before it is built. At present inquiries are out for about 200 locomotives and 12,000 cars. Orders for many of these will be placed and material for them will be shipped within next month. It is also known that a number of roads, particularly in the West, are beginning to figure on even larger additions to their equipment than they have recently ordered, and much of this may materialize this fall.

It is reasonable to believe that the 200,000 surplus cars [August 4] do not represent carrying capacity proportionate to the cars that are now carrying freight. Probably a larger proportion of them are old small capacity cars than of those which are being used. For the last year or two railroads have been refusing to haul light wooden cars in trains in which there were heavy steel cars. Another thing which has kept light cars out of service has been the number of cars reported in shops; presumably these cars are the old light ones. The normal percentage of cars in shops is about 5 per cent. Beginning with January, 1908, the reports showed the extent to which roads were taking advantage of light traffic to put through the shops the cars which had seen such hard service in the rush times of 1907. The percentage in shop increased steadily until July, 1908, when it was 10.18 per cent. It then began to fall off and by February, 1909, the date of the last detailed report published, it was 7 per cent.; it is probably about 6 per cent. now. Old cars which did not go through the shops, and which have been standing idle, are probably of no particular use as they stand.

New business may come too quickly. It is only a few months ago that money became available for extensions to plants, and these are not yet finished. The steel industry is already showing the effect of the volume of orders for structural material. Plants are running well up toward their capacity, but are one or two months behind in deliveries and are having trouble getting enough cars.

The Lake Superior Mining Institute.

The fourteenth annual convention of the Lake Superior Mining Institute has passed into history as one of the most successful and enjoyable of all the meetings held by that organization of mining men. Conducted on the Marquette Range, the oldest of the Lake Superior iron districts, with a side trip to Munising, and the Cleveland Cliffs Iron Company's famous game preserve on Grand Island, the meeting was full of interest to every one of the participants. Approximately 300 members of the institute were in attendance, and along with them were a number of prominent railroad officials and others, the business activities of whom are associated with the mining industry. The weather was ideal, and from the time the outing began on Wednesday of last week until good-byes were said Friday night and Saturday, nothing occurred to upset any of the plans made for the entertainment of the visitors. A fine programme had been arranged, and it was carried out to the letter. It had been six years since the institute had last assembled on the Marquette Range, and the visitors found many new and interesting things to observe and study.

It has not yet been decided where the convention of 1910 shall take place, that decision resting with the Board of Managers, but it is the general understanding that the meeting will be held in the Gogebic iron district. The newly elected officers are as follows: President, D. E. Sutherland, Mayor of the city of Ironwood, Mich.; vice-presidents (two years), J. M. Bush, Ironwood; F. W. Sperr, Houghton, and J. H. Rough, Negaunee, Mich.; managers (two years), C. E. Lawrence, Iron Mountain, Mich., and Wm. J. West, Hibbing, Minn.; treasurer, E. W. Hopkins, Commonwealth, Wis.; secretary, A. J. Yungbluth, Ishpeming, Mich. With the exception of Professor Sperr, who is an instructor at the Michigan College of Mines, all of the new officers are actively identified with the mining industry, and with the exception of Mr. Yungbluth, chief accountant for the Cleveland Cliffs Iron Company, all of them are mining superintendents. The list of papers prepared for the Marquette Range meeting was published in last week's issue of *The Iron Age*.

With the assembling of the mining men at Ishpeming on Wednesday, a special train was boarded and the party were conveyed to the Cleveland Cliffs Iron Company's Maas mine, a newly developed property at Negaunee, three miles distant, and which is said to contain the largest deposit of ore yet opened on the range. Returning to Ishpeming, the visitors were taken in street cars and automobiles to the Wanonowin Golf Club, where dinner was served by the ladies of the Episcopal Church. A Cornish wrestling tournament and a league baseball game at Union Park were the afternoon attractions, and in the evening a business session was held at the opera house.

The cities of Negaunee, Marquette and Munising were visited Thursday. At the former place the United States Steel Corporation's Blue and Prince of Wales mines were inspected, and at Marquette the Pioneer Iron Company's blast furnace and the plant of the Lake Shore Engine Works were looked over. The feature of the visit to Marquette was a banquet at which the mining men were the guests of the Lake Shore Engine Works. The dinner was served in a pine grove on the shore of Lake Superior. The trip to Munising was made in the afternoon, a portion of the party going by steamboat and the others traveling in the institute's special trains, these consisting of seven private cars, six sleepers, two diners and one baggage car. A business session was held in the Alger County Court House in the evening.

Friday morning the various industrial plants at Munising were inspected and an excursion was made to Grand Island, at the entrance to the harbor. Friday afternoon was spent in the Swanzey mining district in southern Marquette County. It is here that the Cleveland Cliffs Iron Company is opening a number of valuable mines and where it is establishing its model town of Gwinn. The site of the new town was platted in 1906, and since then the location has been a scene of busy activities. The meeting of the Mining Institute practically came to a close with the visit to the Swanzey country, although the return to Ishpeming was made Friday evening, and some of the party devoted Saturday to an inspection of mines not covered by the regular itinerary.

There are very large deposits of iron ore in the district, of which the model town of Gwinn is the center, and it will not be many years before the place will have a population of 10,000 or more. A number of fine business blocks of stone and brick and many dwelling houses have already been erected. The streets have been graded and the principal thoroughfares macadamized, and water and sewer and electric lighting systems have been installed. A high school was completed last fall at a cost of $45,000. The Cleveland Cliffs Company's district hospital, a model of its kind, is located at Gwinn, and there is under construction a clubhouse, providing all the usual features, together with a library and baths. No buildings other than brick, concrete or some other approved fireproof material are permitted in the business district.

One of the most interesting papers read at the meeting was that of John M. Nelson, Jr., of the United States Forest service, Washington, D. C., in which he discussed "Wood Preservation, with Especial Reference to Mining Timbers." Mr. Nelson contended that, because of the depletion of the forests, the preservation of timber has become necessary. Three times as much timber as is being produced by the forest growth is being consumed, he declared. The forest service has found that the consumption amounts to 200 cu. ft. of wood annually for each person in the United States, whereas in Europe the consumption is but 60 cu. ft. per capita.

The present high price and limited supply of timber suitable for mining purposes are commanding increased attention. Moreover, the grade of timber is rapidly deteriorating. Inferior species of the more plentiful woods are being used to replace those of higher value, on acacount of the decreasing available supply. More money is being paid for less serviceable material than was paid for the better grade of timber a few years ago. Used in their natural condition, the inferior woods decay rapidly, and in a comparatively short time they must be replaced at a higher cost for both timber and labor.

The timber situation, Mr. Nelson declared, cannot be expected to improve, and in the future it will not be so much a problem of what is wanted as what can be obtained. The forest service officials have observed that the mining companies are beginning to grasp the situation and to take definite steps in devising a wood preserving policy. Many mining, railroad and steel companies, particularly in the East, are at present operating plants for treating mine timbers with chemical preservatives. In each case the forest service has co-operated with the companies in working out a wood preserving policy and in designing suitable plants.

Foundry Troubles and Their Remedy.—The first of a series of practical articles on "Foundry Troubles" will appear in the September issue of the *Obermayer Bulletin*. This series of articles is from the pen of R. H. McDowell, who addresses himself to foundrymen having trouble with dead, dirty or hard iron, large breakage and heavy losses in general, cupola melting slowly and hanging when the bottom is dropped, &c. In the first article he gives definite rules by which the average foundryman can overcome a great many of the troubles which now beset him. The series will run for some months and those desiring to read the articles, may have the *Bulletin* sent them free of charge, by addressing the S. Obermayer Company, Cincinnati, Ohio.

Important additions to equipment and other improvements have been under way for a year or more at the National Works of the National Tube Company at McKeesport, Pa. A number of welding furnaces have been added to the plant, but there is still a large amount of work to finish, such as foundry, machine shop, coupling tap department, coupling forge department, &c. It is not expected that all of this work will be completed until about July of next year.

The First Year of the Swedish State Ore Contract.

A French mining engineer, P. Nicou, has communicated to the Comite des Forges de France some very interesting information with regard to the first year's working of the contract entered into in 1907 by the Swedish Government with the Grängesberg-Oxelosund, Gellivare and Kirunavara companies. These contracts provided for a minimum annual export of 600,000 metric tons during the years 1908 to 1917 from the deposits of the Grängesberg-Oxelosund Company, in the Grängesberg District, and total shipments of 18,750,000 tons during the period of 1908 to 1932 from the mines of the same company at Gellivare distributed over the years as uniformly as possible, with the proviso, however, that the company might ship 1,000,000 annually during the first five years. The Kirunavara Company is allowed to ship 75,000,000 tons from the Kirunavara mines between 1908 and 1932, shipments beginning at the rate of 1,500,000 tons in 1908 and increasing in increments of an anunal maximum of 400,000 tons, with the proviso that shipments must not in any year exceed 3,500,000 tons. A later contract, in 1908, following the purchase of the Svappavara mines slightly modified these quantities, but only after 1915.

How the Government Participates in the Profits.

By the same contract, the State received from the Kirunavara Company, gratis, 40,000,000 of Swedish crowns ($10,720,000) of its preferred stock, whose dividends come exclusively from the royalty on the ore shipped. The capital of the Kirunavara Company, therefore, amounted to 80,000,000 of crowns ($21,440,000), the other 40,000,000 being made up of 24,000,000 ($6,432,000), the original capital of the company before the contract, and 16,000,000 ($4,288,000) delivered to the Gellivara Company (capital, 6,000,000, or $1,608,000) in exchange for the surrender to the Kirunavara Company of the Gellivara deposit. The 40,000,000 of common stock divide the profits, after deducting royalties derived from the sale of the Gellivara and Kirunavara ores. Out of the 24,000 shares of the original capital of the Kirunavara, the Grängesberg-Oxelosund Company owned 23,984 on December 31, 1907, and also 5992 out of the 6000 Gellivara shares. A year later the Grängesberg-Oxelosund Company owned all but four shares of each company. Now that the reports of 1908 are available, it is of interest to study the operations of the Grängesberg, Gellivara and Kirunavara mines since the closing of the 1907 contract.

The quantity mined in the Grängesberg District in 1908 was 568,350 tons, as compared with 628,872 tons in 1907. Shipments were 599,417 tons and 666,892 tons, respectively, or considerably below the contract export maximum. This is due to the crisis in the iron industry in Westphalia and in Silesia, to which the bulk of the shipments goes. The net profit per ton was 1.95 crowns (51 cents), or 1.10 crowns (29 cents) larger than that of the preceding year. This was due chiefly to the lowering in the charge for transportation from the mines to the port of Oxelosund from 4.10 to 3.12 crowns ($1.10 to 84 cents) per ton. Since the mining company owns practically all of the stock of the railroads to the Baltic, it loses on one hand what it gains on the other. However, exclusive of this, there is an increase in profit of 0.12 crown, or 3 cents per ton.

The Kirunavara Company owns the whole of the Gellivara deposits, with the exception of the Koskullskulle, which belongs to the Freja Company, controlled by the Witkowitz Steel Works in Austria. The production of the Kirunavara Company's mines in the Gellivara District was 869,010 tons in 1908, as compared with 929,420 tons in 1907. The sales amounted to 876,143 tons, which yielded a gross profit, not including taxes, general expenses and royalties to the State, of 2,656,783 crowns, or $712,018, or 3.03 crowns (81 cents) per ton. This compares with 3.10 crowns (83 cents) in 1907, 2.69 crowns (72 cents) in 1906, 1.75 crowns (47 cents) in 1905, and 1.99 crowns (53 cents) in 1904. During 1908 the work of modernizing the plant at Gellivara was continued. A power plant is being built on the Vassaratrask, where the mine branch line starts from the Lulea-Narvik main line. At present this embraces two 1500-hp. Laval steam turbines, which is laid out to be doubled. Power will be transmitted by electricity to the mines, and new installations have been made both at the old power plant at the Malmberget Railroad Station and at the secondary station at Tingvallskulle. This involved an outlay in 1908 of 825,057 crowns, or $221,125. In 1907 and 1908 752,011 crowns, or $126,338, were spent on workmen's houses.

At Kirunavara the mines produced 1,649,851 tons in 1908, as compared with 1,417,929 tons in 1907. Sales figured up 1,610,957 tons, which yielded a gross profit of 6,723,003 crowns, or $1,801,765. The average profit was, therefore, 4.17 crowns, or $1.12.

Expenses to Be Deducted.

From the profits noted certain expenses must be deducted to arrive at the net profit realized by the Kirunavara Company operating the Gellivara and Kirunavara deposits. The report of the Grängesberg-Oxelosund Company gives the data, but deals only with the totals of both districts. From the gross profits of 9,379,786 crowns ($2,512,703), there must be deducted the royalties, on preferred stock, of 0.50 crown for Kirunavara and 0.25 crown for Gellivara, a total sum of 1,038,027 crowns ($278,091), the royalties due to the heirs of Consul Broms, the founder of the enterprises, which is 0.10 crown on the first 1,000,000 tons, and 0.05 crown per ton on all supplementary tonnage, which figures up to 176,324 crowns ($47,255); taxes, 937,677 crowns ($251,296); administration, port and lighthouse charges, 441,335 crowns ($118,278), and sundry expenses, 224,787 crowns ($60,243), a total of 2,818,150 crowns ($755,264), leaving a net profit of $1,757,439, or 2.64 crowns (82 cents) per ton.

The parent company, now the Grängesberg, paid dividens of 9 per cent. in 1902 and 1903, 9 per cent. in 1904 and 1905, 12½ per cent. in 1906 and 15 per cent. in 1907 and 1908. The company has been developing its railroads and its harbors at Oxelosund, Lulea and Narvik. The fleet of the affiliated interest, the Lulea-Ofoten Company, of six vessels, with 23,200 tons burden, has been increased to 31,200 tons by the addition of an 8000-ton boat. In 1908 the fleet of the company transported 403,676 tons, shipping 188,315 tons from Narvik, 22,348 tons from Lulea and 193,013 tons from Oxelosund.

In 1908 the Swedish Government appointed a commission to study the question of utilizing the deposit of Luossavara, which was ceded to the Government under the 1907 contract, and whose ores were to be solely reserved for national consumption. This commission has declared that on account of (1) the geographical position, (2) the special requirements of the Swedish iron industry and (3) the close admixture of high phosphorus and low phosphorus ores, which require too costly a separation, the Luossavara deposit is of no interest for Sweden and that its sole value is for export. It is probable that the Swedish State will, as the result of this report, persist in its tendency to prohibit the export of low phosphorus ores.

The Sharon Steel Hoop Company, Sharon, Pa., manufacturer of steel billets, sheet and tin bars and steel hoops and bands, which now has five 40-ton open hearth furnaces, is adding a sixth 40-ton furnace. This company recently increased its capital stock and is preparing to take up some new lines of products. It is probable that sheet mills will be added, and it also likely that a blast furnace will be built in the near future.

The Manufacturers' Light & Heat Company, Pittsburgh, supplier of natural gas, has made a contract with a subsidiary interest of the Standard Oil Company for a large supply of natural gas to be sold to consumers. This contract removes the necessity of drilling new wells and laying long pipe lines. The company is preparing to spend upward of $400,000 for new pumping stations.

The Gandy Belting Company's New Building.

With the completion of a large four-story addition the Gandy Belting Company, Baltimore, Md., now claims to have the largest factory in the world devoted to the manufacture of cotton duck belting. The new building has a frontage of 110 ft. on Fremont avenue and 104 ft. on King street. It is of slow burning or New England mill construction, each floor being divided into three bays, each of 25 ft. span, and one bay of 30 ft. span, the load capacity of each bay being 300 lb. per square foot live load. The columns are of Georgia long leaf yellow pine, and the floors are 4 in. thick, made of 3-in. yellow pine plank and 1-in. maple. Three fireproof stairways are provided, also an electric elevator driven by a three-phase induction motor.

The careful consideration given to protection from fire is evidenced in the standard tin covered fire shutters, besides metal window frames and wire glass windows which are provided on all sides exposed to surrounding buildings. It has a complete system of plumbing and electric wiring so arranged that connections and extensions can be made to suit any condition that *may* arise. This feature alone is an undoubted source of economy to factory owners. The future saving in repairs compensates many fold for the comparatively small original expenditure. A 30,000-gal. steel water tank, which surmounts the building, supplies a complete sprinkler system, to which an approved fire pump located in a fireproof compartment is also connected.

A large portion of the floor space is devoted to the specially constructed stretching apparatus designed by the Gandy Belting Company. When it is understood that the stretch in canvas belts has heretofore been one of the most serious drawbacks to overcome in their manufacture, the importance of the success of this device, which is used exclusively by the Gandy Company, cannot be overestimated by belt users. The building was designed, erected and equipped complete by McLaughlin Brothers, Inc., Baltimore and Philadelphia.

The business was established by Maurice Gandy in 1877, and his invention, the Gandy belt, has now come into extensive use throughout the entire civilized world, progressive agencies having been established in such far removed points as Yokohama, Japan; Shanghai, China; Cape Town, South Africa, as well as the important cities of most of the European countries. The foundation of the Gandy belt is a very heavy duck, woven in the Gandy Belting Company's own duck mill according to specifications adopted by Mr. Gandy 30 years ago and never since changed, as exhaustive tests have conclusively proven this particular weave of duck best for belting purposes. It has an even strain throughout.

One of the most interesting features found in the Gandy Company's factory is the sewing machines used. These machines were built in the company's own machine shops and have patented features not possessed by other machines. One of these is that they stitch with an imbedded stitch, resulting in a smooth surface for the belt and at the same time welding the plies more solidly together. After stitching the belt is treated to a secret process which renders it water, heat and steam proof. With these exclusive features, the manufacturer claims that it produces the most durable belt on the market for driving, elevating and conveying purposes.

The policy of the Gandy Company is to make shipments on all orders on the day of their receipt. Belt users can best appreciate the advantages of this feature who have found the necessity of procuringi a belt in a hurry. For this purpose the company carries in stock more than 1500 rolls of straight roll belting, in all sizes from 1-in. 4-ply to 30-in. 10-play. For the thresher trade alone it carries a stock of more than 5000 endless thresher belts to draw upon at all times.

Schulze & Naumann of Coethen, Germany, will install the first S. & N. beam shear in this country at the New England Structural Company's plant in East Everett, Mass. This type of shear has been in successful operation in Germany, where the Differdingen mills have been rolling beams under the Grey patents. It has a capacity for standard I-beams, 7 to 20 in., 80 lb.; Bethlehem sections of beams up to 18 in., and with special tools Bethlehem 20 and 20a; channels up to 15 in., and angles up to 6 x 6 x ¾ in. The shear requires 20 hp. for its maximum capacity, making a cut in 15 to 25 sec. It is 12 ft. long, 4 ft. wide and 9 ft. high and weighs 20,000 lb. The American agent for the S. & N. beam shears is the Wiener Machinery Company, 50 Church street, New York City.

The Oxygen Flame for Cutting Metals.

In view of the introduction in various lines of the oxy-hydrogen and oxy-acetylene processes of cutting metals, the following Paris correspondence of the London *Times Engineering Supplement* is of interest. The oxygen melting process of Dr. E. Menne, Creuzthal, Germany, was described in *The Iron Age* of January 21, 1909, page 222, as applied to freeing frozen tapholes and tuyeres and to other iron and steel works uses. Some of the patents of Dr. Menne's company, the Cöln-Müsener Bergwerks Actien Verein, are referred to in the extract:

"An interesting question has recently come before the Tribunal de la Seine respecting the rights of the manufacture and use of oxy-hydrogen and oxy-acetylene blowpipes for cutting metals. The French Oxy-hydrogen Company claimed exclusive powers over all apparatus for such purposes based on this principle; it has prosecuted a number of other companies for infringements and has effected seizures of apparatus constructed by rival concerns. The Tribunal has decided that the claims of the French Oxy-hydrogen Company have no foundation in fact; that previous to the date of the patents cited on behalf of the prosecutors this particular process was employed by the Cöln-Müsener Company; moreover, that a detailed technical description of the process was given by Dr. Menne in 1903 in a lecture published in the *General Review* of German Engineers. On the other hand, it is laid down that the above company has not secured by means of a patent the actual principle relied upon for cutting the metal by means of the oxy-acetylene or oxy-hydrogen blowpipe, nor the use of a jet of oxygen gas immediately following the process of heating the line of the cut by the high temperature flame of the blowpipe, thereby causing the rapid oxidation of the metal and in consequence the cutting action. It follows from this judgment that the process of cutting metals by means of the blowpipe flame becomes common property in France."

Remarkable Paper Finds of Iron Ores and Coal.

The extravagant claims made for mineral deposits of which "discoveries" are made from time to time have naturally caused all such reports to be received subject to heavy discounts. Not long ago some stir was occasioned by reports of important iron ore finds in Virginia, the deposits, it was said, being accompanied by remarkable beds of anthracite coal. A correspondent of *The Iron Age* who has means of knowing what basis of fact exists for the glowing reports put forth on some of these late "additions" to Virginia's mineral wealth writes as follows:

"When I tell you that the iron ore is 125 ft. wide and 11 miles long, and of unknown depth, and that right under it is the finest anthracite coal in the world; that both can be mined from the same opening; that iron can be made there cheaper than anywhere else in the world; that Lake Superior and Alabama will be nowhere, and that all this has been found out by a traveling newspaper reporter, you can tell whether the iron trade ought to take alarm. The ores are the brown hematites of Rogers No. III and have been known and worked for many years in the past in small charcoal furnaces. The coal is what is known as Virginia anthracite and is worked for local use along Walkers and Brushy mountains on the line of the great fault of 10,000 ft. It is a beautiful free burning coal, with the slight drawback that you take out more ashes than you put in coal. It is entirely unfit for any metallurgical purpose."

Trade Publications.

Pumps, Well Supplies, Fittings, &c.—Ideal Pump & Mfg. Company, Green City, Mo. General catalogue No. 3, 6 x 9 in., 148 pages. In addition to describing a full line of cistern pumps, lift pumps, windmill pumps, &c., the book includes an especially complete line of well drilling equipment, malleable iron fittings, foundry supplies and a general line of plumbing and heating supplies which the company carries as a jobber. An announcement is included to the effect that the company does foundry and machine shop custom work.

Steam Appliances.—Atwood & Morrill, Salem, Mass. Catalogue B, 6 x 9 in., 22 pages. The line described includes extra heavy pressure regulators, vacuum pressure regulators, pump governors, copper float traps, back pressure valves, relief valves, balance lever valves, fan engine controllers, damper regulators, &c., all known by the trade name of Twentieth Century steam appliances.

Threading Tools.—American Tap & Die Company, Greenfield, Mass. Catalogue No. 3, 6 x 9 in., 71 pages. Taps, dies, tap wrenches, die stocks, screw plates, &c., are treated of, and the book shows some assortments of threading tools put up in cases and designed for special purposes, such as contractors' sets, automobile assortments, &c. Lists of standard sizes of taps and dies are given, with prices.

Steam Heating Systems.—The Harrison Safety Boiler Works, North Philadelphia, Philadelphia, Pa. Catalogue, 6 x 9 in., 48 pages. Leading commercial systems of exhaust steam heating are discussed and drawings are included showing several varieties of both gravity return and vacuum systems in which a vacuum pump or ejector is used for withdrawing water and air from radiators. Several variations from these two main types are described and comparisons of different systems of piping open feed water heaters when installed in connection with such exhaust heating systems are given. The book then goes on to describe the Cochrane steam-stack and cut-out valve heater and receiver. This feed water heater renders unnecessary the use of an independent separator to protect the heating system from oil, and methods by which space in crowded boiler rooms can be economized are described. The book is well illustrated and the diagrams are made especially clear with the aid of colored inks. The new Cochrane heater was described in *The Iron Age* June 10, 1909.

Alloy Steels.—American Vanadium Company, Pittsburgh, Pa. Pamphlet. This is a reprint of a paper by John A. Matthews, which appeared in the Mining and Metallurgical section of the *Journal of the Franklin Institute* for May, 1909, and discusses the use of alloy steels in automobile building.

Steam Turbines.—The Terry Steam Turbine Company, Hartford, Conn. Catalogue 3, 6 x 9 in., 15 pages. A standard turbine made by the company is shown and graphically described. This turbine is of the compound velocity stage impulse type and is made for direct-connected sets up to and including 300 kw. for condensing or noncondensing service.

Diaphragm Bilge Pump Outfits.—Fuller & Johnson Mfg. Company, Madison, Wis. Bulletin No. 500. Shows and briefly describes a complete power driven outfit for use of contractors, ship and barge owners, &c., where it is necessary to raise large quantities of water or to handle water containing mud, sand, coal or sewage. The outfit is compact and portable.

Sawmill Machinery.—William E. Hill & Co., Kalamazoo, Mich. Catalogue, 6½ x 10 in., 244 pages. A very complete line of sawmill machinery is described in addition to transmission machinery and engines. The catalogue is divided into sections. The first is devoted to a general line of machines used on the sawing floor of a mill; the second section illustrates transmission and conveying machinery, such as log jackers, skid lifters, lumber sorters and conveyors. Other sections are devoted to log, board and wood cutting and splitting machinery, lath mill machinery, filing room machinery and engines. Interesting illustrations of logging and sawmill operations are given, and the book is well indexed.

Machines and Small Tools.—The Cleveland Punch & Shear Works, Cleveland, Ohio. Hand book and stock list; 56 pages. Contains data such as how to standardize a punching machine and advices for ordering special tools, and some handy tables and a stock list of machinery, such as bending rolls, rotary planers, punch and shears, I-beam punch and coping machines, and the like

Disk Grinders and Their Supplies.—Gardner Machine Company, Beloit, Wis. Loose leaf catalogue, 9 x 11 in. Contains illustrations of disk grinders, with which are furnished special sets of toolroom equipment to meet different shop conditions. Grinding attachments are shown and records of tests made with the various grinders turned out by the company are given. These include records of the performances in grinding cast iron piston rings, centrifugal pump impellers, automobile parts, &c.

Lathes.—Seneca Falls Mfg. Company, Seneca Falls, N. Y. Catalogue 22-B, 6 x 9 in., 36 pages. A screw-cutting lathe made in two sizes—namely, 9 and 11 in. swing, which is available for use by belt, electric motor drive or foot power, is shown, together with a screw-cutting engine lathe which is made in the same sizes. The various parts of a standard engine lathe are described and their workings are clearly demonstrated with the aid of good illustrations. Wood turning lathes and various lathe attachments are also illustrated. Among the lathes shown is the new No. 30 H. Star screw-cutting engine lathe described in *The Iron Age* August 26, 1909.

Sewer Castings.—Thomas Carlin's Sons Company, Pittsburgh, Pa. Catalogue, 7 x 10 in., 36 pages. Contains drawings of sewer castings, such as side and corner inlets, trap plates, car track inlets, &c., designed to meet different street conditions, and prices are included.

Blue Print Paper.—Keuffel & Esser Company, Hoboken, N. J. Circular. Treats of the Helios blue print papers, which are put up in different qualities for special purposes, including regular blue print paper requiring from four to eight minutes' exposure for bright sunlight, paper intended for quick reproductions where no good light is available, and paper for use with electric light and with electric printing machines. The circular also calls attention to the fact that the company does blue printing for the trade.

Labor Notes.

The number of men sent out to positions in machine shops by the employment bureaus of the West has been increasing recently. In July three times as many men were given positions by the members of the Metal Trades Association of Chicago as in July, 1908. In the Pacific Coast States the metal working trades are increasing their output and the number of inquiries for good men in those districts has been increasing in the past two months.

No action has been taken by members of the New York and New Jersey Metal Trades Association on the demand made some weeks ago by the International Association of Machinists in the district of New York for recognition of the union and a new wage scale. The conditions in machine shops in and around New York have not changed materially in the summer months. Working forces have increased somewhat, but there are still a considerable number of machine shop and boiler shop employees out of work. No concerted action has been taken by the union employees toward enforcing their demand.

It is understood that at the British Trade Union Congress at Ipswich, England, in the first week of September, questions of international import will be considered. President Gompers of the American Federation of Labor, John P. Frye, secretary of the International Iron Molders' Union, and other representatives of union labor in the United States will attend the convention to participate in the discussion of a proposed international federation of labor.

The report of the Anthracite Conciliation Board covering the three years of its work between April 1, 1906 and April 1, 1909, shows that only 23 grievances were presented in that period. As against 336 pages in the previous volume, the present one contains but 69. In the past three years only three grievances were referred to umpires.

The Interstate Iron & Steel Company, operating sheet mills at Cambridge, Ohio, has reached an agreement with the Amalgamated Association and has signed the sheet mill scale.

The strike at the puddling plant of the A. M. Byers Company, at Girard, Ohio, is ended, the men having returned to work at Amalgamated scale rates, but the company does not recognize any labor organizations nor does it sign any scales.

The improvements which the R. Munroe & Sons Mfg. Corporation, Pittsburgh, will make include the erection of a new steel building, 100 x 200 ft., on Smallman street, to contain a 25-ton electric traveling crane, a new large Wood hydraulic press having a capacity of work up to 10 ft. in diameter, &c. Contracts for this building and equipment have been let and erection will be commenced shortly. When completed and in operation, the plant will have about doubled its present capacity for making boilers, stacks, tanks, plate work, flanged boiler and tank heads, pressed and formed work, &c.

PERSONAL.

Judge Elbert H. Gary, chairman of the United States Steel Corporation, who is now in Europe, was the guest of honor at a dinner given by the Chamber of Commerce, Sheffield, Eng., on the evening of August 26. Speaking to a toast, he dwelt on the interdependence of trade conditions in England and the United States. It is stated that he declared that he had no objection to free trade provided all countries adopted it, but it was not fair that industry should be protected in one country and not in another.

Owing to the continued illness of Edward Fitz Gerald, Grand Rapids, Mich., heretofore secretary of the company, the Mitchell-Diggins Iron Company, operating a charcoal blast furnace at Cadillac, Mich., has been reorganized with the following officers: President, William W. Mitchell; vice-president and secretary, Joseph C. Ford, Fruitport, Mich.; treasurer, Fred A. Diggins; manager, Joseph C. Ford. The above, with Frank J. Cobbs, make up the Board of Directors. Mr. Ford is also president and treasurer of the Spring Lake Iron Company, operating a charcoal furnace at Fruitport, Mich.

President Wm. G. Mather, Cleveland, and the other directors of the Cleveland-Cliffs Iron Company are on their annual trip up the lakes for the inspection of the company's properties in the Marquette and other districts of Lake Superior.

Arthur W. Taylor, who has been in charge of the open hearth department of the Atlanta Steel Company, Atlanta, Ga., has accepted the position of superintendent of the open hearth and blooming mill departments of the Southern Iron & Steel Company, at Gadsden, Ala.

W. R. Smith, formerly of the Galloway Coal Company, with headquarters at Birmingham, Ala., has been appointed sales manager for the Yolande Coal & Coke Company, in the same city.

C. D. Alcorn, formerly attached to the Pittsburgh office of Wickes Brothers, is now looking after the machinery department of the L. A. Green Company, Pittsburgh.

H. F. Affelder has joined the Allis-Chalmers Company's sales organization, with headquarters at Pittsburgh.

Leonard S. Downe, formerly connected with the selling force of the International Heater Company, has resigned his position with that company to become Western representative of W. A. Russell & Co., steam specialties, New York and Waterbury, with headquarters in Chicago. He is a son of George W. Downe, manager of the boiler department of the American Radiator Company.

W. C. Runyon, president of the Struthers Furnace Company, Cleveland, Ohio, has returned from Europe.

Herbert Dupuy, chairman of the Crucible Steel Company of America, Pittsburgh, has returned from Europe.

F. C. Armstead, supervising engineer of the stoker department of the Westinghouse Machine Company, for a number of years located at East Pittsburgh, has moved his headquarters to the Westinghouse Works, Attica, N. Y., where stokers are manufactured.

R. H. Boggis and B. F. Wade, president and treasurer, respectively, of the Taylor & Boggis Foundry Company, Cleveland, returned home last week from a short trip to Europe.

A number of leading steel companies propose to give a dinner to Judge E. H. Gary, chairman of the United States Steel Corporation, on October 15.

Edward P. Dickinson, who for the past 14 years has had charge of sales in the Southwest for the Chicago branch of the Jones & Laughlin Steel Company, has resigned to take charge of the manufacturing of gasoline engines and agricultural implements for the William Galloway Company, Waterloo, Iowa. Under a reorganization of this company, its authorized capital stock has been increased from $200,000 to $400,000. Mr. Dickinson has been elected vice-president and a director of the company and is also a member of the Executive Committee.

Burton L. Verner, formerly assistant purchasing agent of the Republic Iron & Steel Company, Chicago, has been appointed sales manager of the Blue Island Car & Equipment Company, with offices at 607 Fisher Building, Chicago. He will have special charge of the new merchant bar mill which the company expects to start this week.

Frank E. Richardson, formerly secretary of the Pittsburgh Forge & Iron Company, Pittsburgh, has been elected president and treasurer, to succeed Calvin Wells, deceased. W. I. Miller, formerly assistant secretary, has been elected secretary.

OBITUARY.

DALLAS C. BYERS, president of the A. M. Byers Company, manufacturer of iron pipe, Pittsburgh, died at Dinard, France, August 26, aged 35 years. His death was caused by a paralytic stroke. He underwent an operation at Geneva, Switzerland, last spring, and his health has been failing since that time. He was born in Pittsburgh and was the second son of the late A. M. Byers, whom he succeeded as president of the A. M. Byers Company. He received his early education at St. Paul's Preparatory School, Concord, N. H., and was a graduate of Yale University. Mr. Byers was a member of the Pittsburgh, Duquesne, Allegheny Country and Pittsburgh Golf clubs, a director of the Bank of Pittsburgh and the Guarantee Title & Trust Company, and was interested in various other enterprises. His brothers, E. M. and J. F. Byers, are both connected with the A. M. Byers Company.

Pittsburgh Valves and Pipe Fittings.—An octavo volume of 516 pages of text and illustrations has been published by the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa. Besides being a catalogue of this company's products, superseding a similar volume issued in 1905, it is a compendium of practice in the manufacture of valves and pipe fittings for the installation of steam, gas, water and air piping. Some idea is given in the earlier pages of the book, by illustration and description, of the extent and variety of the company's plants. There are three departments: First, manufacturing, in which is complete equipment for making pipage plants; second, erection, with facilities for the installation of piping, including the largest contracts; third, engineering, under which come designing and estimating piping contracts, particularly those involving special valves or other equipment. Many of the data contained in the volume are based on destruction tests of valves and fittings up to 36 in. In the latter portion of the book are given general dimensions of all the material furnished by the company, this being so arranged as to facilitate the work of the draftsman or engineer in laying out piping. A number of tables on these pages have been specially compiled for this publication.

From the National Red Cross headquarters at Washington the information is given out that instruction in first aid to the injured will be given by the society in the coming month to more than 20,000 employees of the United States Steel Corporation. As far as possible local physicians will be employed as instructors. Classes will be formed in the large cities of the country for similar training of employees in all industrial lines.

Mackintosh, Hemphill & Co., Pittsburgh, have received an order from the Forged Steel Wheel Company, Butler, Pa., for a twin direct reversing engine with cylinders 55 in. in diameter and 60-in. stroke. It will drive the new universal two-high slabbing mill, which is also to be built by the former for the open hearth steel plant being erected by the latter at Butler, Pa.

Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

Patents—Infringement.—The replacing of a coil spring in a patented machine by a flat or leaf spring which performs the same function in substantially the same way is merely the substitution of a mechanical equivalent, and does not avoid infringement. The Coffield reissue patent, No. 12,719 (original No. 806,779) for a water motor was not anticipated, and discloses invention, and is not invalidated by any irregularity in the granting of either the original patent or the reissue. (United States Circuit Court, Northern District, West Virginia; Peter T. Coffield & Son *vs.* Spears & Riddle, 169 Federal Reporter 641.)

Patents—Molds for Casting Rolls.—The Lewis patent, No. 574,616, for a mold for casting rolls, designed to hold the roll at equal distance from the inner wall of the chill mold while cooling, and thus secure a uniform depth of chill, construed and held not infringed. (United States Circuit Court, Western District, Pennsylvania; Lewis *vs.* Mesta Machine Company, 169 Federal Reporter 422.)

Patentable Subjects—Infringement—Machine for Making Wire Fence.—The mere function or operation of a machine or other device, as distinguished from the machine or device itself, is not patentable. A patent cannot cover generally any and every means or method for producing a given result. While the principle of a machine or device and the mode of its operation are required to be set out in the specification of a patent therefor, they cannot be made the subject of a patent, but only the machine or device itself is patentable. The phrase, "functions of a machine," as used in the patent law, defined as that power or property of the machine of acting in the specific manner designed or intended by its construction; in other words, that which the machine is designed to do, as distinguished from the machine itself, and from the product of its action on something external to itself. A patent is a contract, and the rules for the construction of contracts generally control in its interpretation; and when its terms are plain, and the intention of the parties clearly manifest therefrom, they must prevail; but if its expressions are ambiguous, or its validity or any claim is doubtful, that construction will be given which will sustain rather than destroy the patent. A new combination of old elements or devices whereby a new and useful product is produced or an old product is attained in a more efficient and economical way may be protected by a patent. The Bates patent, No. 577,639, for a machine for making woven wire fence, is not invalid on the ground that its claims are for a mode of operation or principle or function of a machine, but is for the machine itself, designed to produce a certain described fabric; nor are the claims so broad as to include any and every machine for making this same fabric, but is for a new and novel combination and discloses invention. The term "mechanical equivalent," as used in the patent law, means that each of the ingredients comprising the invention covers every other ingredient which in the same arrangement of the parts will perform the same function, if that was well known as a proper substitute for the one described in the specification at the time of the patent. (United States Circuit Court of Appeals, Eighth Circuit; Denning Wire & Fence Company *vs.* American Steel & Wire Company of New Jersey, 169 Federal Reporter 793.)

Corporations—Stock—Pledges—Liability of Stockholder.—A corporation has power to pledge its stock as collateral security. Proof that stock has been issued and has not been paid for establishes a prima facie case in an action by the trustee in bankruptcy of the corporation against the stockholder for the unpaid balance. In the absence of a statute, proof that stock issued to one was so issued or retained as security for a debt is no defense to a suit by the trustee in bankruptcy of the corporation for the unpaid balance due on the stock, where the stock was issued directly to the holder as an owner and so appeared on the corporate books. The purpose of the Iowa statutes which require the secretary of a corporation whose stock is transferred as collateral to keep a record of the facts, &c., is to enable stockholders to hypothecate their stock without a cancellation and the issue of new stock and protect the pledgee against the claims of creditors of the pledgor and purchasers without notice. Under the Iowa statutes, which provide that no holder of stock as collateral shall be liable for assessments thereon, &c., a holder of stock as collateral is exempt from liability as a stockholder, though the stock was issued directly to him as an owner and so appeared on the books of the company. (Iowa Supreme Court, Tierney *vs.* Ledden, 121 Northwestern Reporter 1050.)

Insolvent Corporations—Rights of Purchasers of Real Estate.—Plaintiff, knowing that a corporation was insolvent, contracted to purchase certain real estate from it, the agreement providing for the return of earnest money in case the title should not be approved and insured by a certain trust company. All of the creditors of the corporation except one assented to the conveyance, and the trust company agreed to reserve enough out of the purchase price to pay the claim of the nonassenting creditor, and expressed its approval of the title and its willingness to insure the same. Held, that plaintiff was not entitled to a return of the money and to refuse title on the theory that the statutes of the State of the corporation's domicile prohibited a corporation from making a conveyance while insolvent, the contract to convey being at most voidable and not void. A purchaser of real estate cannot recover earnest money paid, in the absence of proof that the vendor did not offer to convey a valid title. Plaintiff having rescinded the contract on the ground that the corporation could not convey a valid title, could not recover the earnest money on an implied contract by the representatives of the corporation's creditors, who, after receiving the money immediately paid it to the corporation's secretary as liquidating trustee, and who used the money to satisfy the corporation's obligations. (New York Supreme Court, Appellate Term; Scharrath *vs.* Dermody, 117 New York Supplement 986.)

Bankruptcy—Proceedings Against Partners.—The provision of the Bankruptcy Act that "in the event of one or more, but not all, of the members of a partnership being adjudged bankrupt, the partnership property shall not be administered in bankruptcy unless by consent of the partner or partners not adjudged bankrupt," contemplates a case where one or more, but not all, of the members of a partnership are adjudged bankrupt, while the partnership as such is not before the court. A partner may file a petition in voluntary bankruptcy on behalf of himself and of the partnership, and in such case the proceedings are voluntary as to both himself and the partnership and their respective creditors, and no act of bankruptcy on the part of the partnership need be shown; but as to a non-assenting partner the proceedings are involuntary, and he may, under general order, on being served with notice, appear and make proof, if he can, that the partnership is not insolvent or had not committed an act of bankruptcy. Where a voluntary petition is filed by a partner on behalf of himself and the partnership, on which the partnership is adjudged bankrupt, a non-assenting partner cannot be adjudicated a bankrupt, and, if solvent, has the right to take upon himself the settlement of the partnership business, reporting to the court the residuum of assets remaining to be distributed by the court among the partnership creditors; but in any event he is required under general order to file a schedule of his debts and an inventory of his property, since the surplus of his property over his debts is an asset of the firm to be applied by the court, if necessary, to the payment of the partnership debts. (United States District Court, Eastern District, Wisconsin; in re Junck & Balthazard, 169 Federal Reporter 481.)

Bankruptcy — Partnerships — Homestead Exemptions.—Under the Alabama statute which provides that "no property, real or personal, held or owned by partners as partnership property, or purchased with partnership funds for partnership purposes, shall be subject to homestead or other exemption as against copartners or partnership creditors," bankrupt partners are not entitled to homesteads from real estate bought with partnership funds and conveyed to the partners jointly, and thereafter used in part as a partnership store and in part as a dwelling by one of the partners, where no claim of homestead was made prior to the bankruptcy, nor in the voluntry petition in bankruptcy filed by them, and in the absence of any evidence to rebut the presumption that the property was bought and held for partnership purposes. (United States District Court, Southern District, Alabama; in re McCrary Brothers, 169 Federal Reporter 485.)

Bankruptcy—Acts of Bankruptcy.—A resolution adopted by the Board of Directors of a corporation authorizing an attorney to represent the corporation generally in any bankruptcy proceedings pending or that may be brought, and in his discretion to agree to the appointment of receivers, did not constitute an act of bankruptcy on the part of the corporation within the Bankruptcy Act. An officer of a corporation cannot commit an act of bankruptcy in its name and behalf by admitting its inability to pay its debts and its willingness to be adjudged a bankrupt on that ground without express authority. Where two petitions in involuntary bankruptcy were filed by different creditors against a corporation, one of which did not present grounds upon which it could legally be adjudged a bankrupt, and the adjudication was made on grounds alleged in the other, the attorneys in the latter are entitled to the fee allowed for filing the petition and procuring the adjudication. (United States District Court, Northern District, Alabama; in re Southern Steel Company, 169 Federal Reporter 702.)

Corporations—Stockholders—Voting Trusts.—Where a voting trust was created by a majority of the stockholders of a corporation and recited that it should be operative whenever a majority in amount of interest should sign the agreement and deposit their stock certificates, the corporation not being a party to the agreement, neither it nor the nonconsenting minority were liable thereon for the trustee's compensation. That agreements for the management of corporations by means of voting trusts are common and customary was insufficient to create a contract for services

between a corporation so managed and the trust company rendering them. The trust company had a lien on the stock certificates deposited for its services. A voluntary courtesy moved by a previous request, while a good consideration for an express promise, is not sufficient, in the absence of benefits conferred, to raise an implied promise, and, therefore, the fact that the corporation made two payments to the trustee under the voting agreement as mere gratuities for its services was insufficient to create an implied obligation to pay for future services. A corporation, though having a legal interest in having its officers act wisely and efficiently, has no such interest in the determination as to who shall be chosen as its officers at any particular election, pursuant to a voting trust. Where a corporation acquires shares of its own stock, it can vote or authorize others to vote them, but it cannot put them into a voting trust nor assist any of its stockholders to do so and identify itself with their interest by binding itself to assume the expenses incident to the attainment of their purpose. Defendant, the National Wire Company, finding it impossible to pay dividends on its preferred stock, organized the Consolidated Wire Company, which acquired title to the preferred stock in the National Wire Company, and then mortgaged it with other property to a trust company to secure an issue of certain bonds. The mortgage provided that the mortgagor should pay reasonable compensation to the trust company, or, in default, that the payment should be a charge on the mortgaged property and that the trust company should have a first lien thereon for its reasonable expenses and compensation for its services as trustee. Held, that a vote of the directors of the National Company during the subsequent period of two years, authorizing its officers to lend to the Consolidated Company such sums as might be needed to finance it, did not impose on the National Company an absolute obligation to pay for the trustee's services rendered to the Consolidated Company. (Supreme Court of Errors of Connecticut; Clark *vs.* National Steel & Wire Company, 72 Atlantic Reporter 930.)

The Tungsten Ores of Canada.

A report on the tungsten ores of Canada by T. L. Walker, a pamphlet of 56 pages, is issued by the Mines Branch of the Canada Department of Mines. Preceding the description of Canadian tungsten deposits is a general statement concerning tungsten ores, their ordinary geological occurrence, with some description of the mines now producing these ores in various countries. Samples of tungsten concentrates collected from various parts of Canada were analyzed in connection with the investigation covered by the report. The result was the discovery of appreciable quantities of tungstic acid in concentrates from the following mines: Cariboo and Moose River mines, Halifax County, Nova Scotia; Granite and Poorman mines, near Nelson, British Columbia; Kootenay Belle mine, at Salmo, and Ymri mine, Ymri, both in British Columbia.

A brief appendix to the report refers to some recent discoveries of tungsten ores in Halifax and Lunenburg counties, Nova Scotia, and in the Yale and Atlin districts, British Columbia. The report says that in most instances the quantity of ore available at Canadian deposits is insignificant. In other cases the grade is very low. The discoveries have importance, however, as indicating the probability of richer or larger deposits in the vicinity. The general conclusion reached is that while there are no well developed and established tungsten ore mines in Canada, there are numerous districts where these ores occur and many claims well worth developing.

The Niagara Machine & Tool Works, Buffalo, N. Y., has purchased a tract of 7 acres on the industrial tracks of the New York Central Belt Line at Northland avenue and will at once erect thereon a complete and extensive plant for the manufacture of its large line of machinery and machine tools. The company's present plant at Superior and Randall streets has proved too small for its expanding business.

The new 152-in. plate mill of the Otis Steel Company, Ltd., Cleveland, Ohio, was placed in operation August 26. There is only one other 152-in. mill in the country, one of the same capacity being operated by the Worth Brothers Company, Coatesville, Pa.

Operations at Benson Mines.

The Benson Mines Company started operations this month at its iron mines and concentrating plant at Benson Mines, St. Lawrence County, N. Y. Diamond drilling has been in progress for some time, opening up large beds of ore running from 33 to 40 per cent. in iron. The old mill was repaired and its mechanical difficulties removed with a view to demonstrating what is the best preparation of the ore, this being preliminary to building a new mill of large capacity. The two nodulizing kilns, which have been already referred to, will be completed in October. At present owing to the necessary straightening of the quarry, the output is only about 200 tons of concentrates a day. It is expected, however, that when the full faces of ore are exposed 500 tons a day can be produced and that ultimately this will be increased to upward of 1000 tons. The ore is now running from 62.80 to 64.80 per cent. in metallic iron, with phosphorus about 0.04 to 0.05 per cent. Shipments are being made to furnaces East and West producing both Bessemer and foundry irons. When the nodulizing kilns are completed the ore will be screened, the coarser portions being shipped separately, while the fines will be nodulized. Two grades of ore can then be shipped, the coarse containing about 60 per cent. metallic iron and the nodulized, 65 to 66 per cent.

The principal interests in the Benson Mines Company are Harry Payne Whitney, August Heckscher; the Burden Iron Company, Troy, N. Y., and Pilling & Crane, Philadelphia. Considerable holdings were retained by the previous owners, particularly A. W. Thompson, John C. Eden and others connected with the Inland Steel Company, Chicago.

The Susquehanna Smelting Company, Lockport, N. Y., manufacturer of high grade electrolytic ferrosilicon, which is at present marketed through Rogers, Brown & Co., have under way an additional building, 90 x 150 ft., to be utilized for an extension to its electric furnace. The steel work on the new building is in the hands of the American Bridge Company, and general construction by William E. Huston, a local contractor. Orders have been placed for all the equipment except an extensive conveyor system, the details of which are not yet definitely determined. The new addition will be ready to occupy in about 60 days. T. E. Vivian Bond is president and H. C. Harrison is secretary.

James J. Hill says that while the Northwest will harvest a wheat crop about 50,000,000 bushels larger than that of a number of previous years, it will not be a bumper crop, and the expectations recently expressed in many quarters will not be realized. It is reported that 50,000,000 bushels damage has been done the corn crop of Nebraska by the drought. In the Chicago market the view is expressed that a 3,000,000,000 bushel corn crop is out of the question, and that in view of the drought in States west of the Missouri it will take the best of weather to give a total of 2,800,000,000 bushels.

The plant of the Waynesburg Forge, Sheet & Tin Mills at Waynesburg, Pa., was bought at receivers' sale on August 25 by Waynesburg parties for $22,000, and it is said that a company will be organized to operate it. The plant has been idle for three or four years. It contains three billet heating furnaces, six sheet and pair furnaces, six annealing furnaces, three hot sheet mills and four mills on which black plates for tinning are rolled. In 1901 a forge was added for making charcoal knobbling blooms, and a separate galvanizing department was also built.

The Southern Steel & Iron Company continues to rush the work of rehabilitating its plants and the erection of its new wire rod, wire and nail mill at Gadsden, Ala. It is understood that it has begun to tear out the old lining preparatory to relining the Chattanooga Furnace.

NEWS OF THE WORKS.

Iron and Steel.

The Portsmouth Steel Company, Portsmouth, Ohio, reports that the blooming and three-high plate mills will be put on double turn August 30. Work is being pushed as rapidly as possible on the new continuous furnace the company is installing for the bar mill. The foundation for the new blooming mill is completed, and work will be started at an early date on the new shears for the large plate mill. The company will also shortly erect four new tin plate mills and several jobbing mills. With the present equipment and the completion of the improvements mentioned, the company expects to have one of the best equipped plants in the country.

The Chrome Steel Works, Chrome, N. J., is erecting a new building, 100 x 180 ft., of steel and brick construction, in order to increase its capacity.

General Machinery.

The Chicago, Burlington & Quincy Railroad is moving its roundhouse at Sterling, Ill., to a new location, having sold the site now occupied to the Russell, Burdsall & Ward Bolt & Nut Company.

It was recently stated in these columns that the Detrick & Harvey Machine Company, Baltimore, Md., started its plant on full time August 6. This is in error, as the plant was placed on full time July 6.

A new factory of considerably increased capacity is to be constructed by the Twentieth Century Gas Machinery Company, Waterloo, Iowa.

A machine shop, 30 x 70 ft., will probably be built by L. A. Tinnes, Bird Island, Minn.

The Dean Bros. Steam Pump Works, Indianapolis, Ind., will build a one-story, 50 x 120 ft., brick addition to its plant.

Foundries.

The Syracuse Safe Company, Syracuse, N. Y., has awarded contract for the construction of a combination foundry and machine shop building, part one and part two stories, 50 x 300 ft., of brick and steel construction, to be erected on Free street, for the manufacture of safes, vault doors and linings.

The Charles A. Stickney Company, St. Paul, Minn., manufacturer of gasoline engines and pump jacks, is building an extension to its foundry, 85 x 130 ft., to cost about $20,000.

The Tropenas Steel Company, New Castle, Del., recently purchased a line of direct current motors for driving machinery in its works.

John H. Cochrane, formerly with the Pennsylvania Foundry Company, and Henry Rabe have organized the Eberton Brass Foundry Company, York, Pa., where a general foundry business will be conducted, manufacturing brass, bronze, copper and aluminum castings. The company has a foundry building, 28 x 40 ft., with sufficient yard space, which it expects to place in operation this week.

The new foundry being erected by E. E. Brown & Co., Philadelphia, Pa., will be 86 x 112 ft., one and two stories, of structural iron and reinforced concrete. The American Bridge Company has the contract for the structural iron work.

The Harrold Foundry & Machine Company, New Kensington, Pa., has recently changed the method of driving its machine tools from gas engine to motor, and is now rearranging its foundry to increase the floor space, utilizing a section of the machine shop for this purpose. The company conducts a general gray iron foundry business, making a specialty of mill work, its melting capacity being about 20 tons daily.

The Mohawk Foundry Company, Schenectady, N. Y., which was recently incorporated, with a capital stock of $25,000, by Adam F. Shaffer, A. F. Hallbauer and M. V. Hoffman, will erect a foundry in Scotia, at Vley road and the Boston & Maine Railroad. The plant is to consist of two buildings, machine shop, 30 x 40 ft., and foundry, 50 x 100 ft., with two cupolas, 12 x 20 ft. each, and core room, 12 x 12 ft. The buildings are to be of concrete and steel, and will be started within the next two weeks. The company will do a general iron and brass foundry business.

The Kingsford Foundry & Machine Company, Oswego, N. Y., has plans under way and will soon start construction on an addition to its foundry and machine shop building, one story, 75 x 125 ft., of brick construction.

Power Plant Equipment.

The capacity of the city electric light and water works plant at Stanton, Neb., is to be increased this summer by the installation of one 8-kw. constant current transformer and regulator, one 100-kw 2300-volt generator, and five miles of transmission lines. B. Henning is superintendent.

Carl S. Spaulding, Glen Ellyn, Ill., has purchased the municipal electric light plant at that place and will improve it by the installation of a 100-hp. suction gas engine and a gas producer within the next 30 days. In the spring of 1910 Mr. Spaulding expects to install a new generator and transformers and change the plant from 133 cycle to 60 cycle.

The Crown Mills, Warsaw, Ky., will soon be in the market for a 10 x 30 in. or 12 x 36 in. Corliss engine.

At Conrad, Minn., the authorities are planning construction of a pumping station and electric power plant.

The Salem Light, Heat & Power Company, Salem, N. Y., has under consideration the installation of an auxiliary gas engine of 150 hp. for use in case the water supply fails. The company is open for bids on a second-hand engine complete, in good condition, preferably one operated by producer gas. W. H. Simpson is superintendent.

H. A. Porter, Oakland, Ill., who has purchased the electric light plant at Kansas, Ill., will give it a thorough overhauling, and make some improvements.

The city of Edgar, Neb., which recently voted bonds in the sum of $5000, has purchased the plant of the Edgar Light & Power Company for $4000. The remaining $1000 will be used to purchase new equipment and for extending the lines.

A new power house is to be built at Greene, Iowa, by the Greene Electric Light & Power Company

Equipment will be required by the Northern Idaho & Montana Power Company for a sub-station to be erected at Newport, Wash.

The Methow Power & Traction Company will build a large power plant in the vicinity of Winthrop, Wash.

The Lamb Wire Fence Company, Adrian, Mich., is installing a 500-hp. Allis-Chalmers Corliss direct connected high tension generator for the purpose of consolidating in one unit the power by which the factory is operated.

The Homestake Mining Company, Lead, S. D., has decided to invest approximately $1,000,000 in the development of Spearfish Creek. Preliminary construction, including a dam, will take over a year.

The Olean Electric Light & Power Company, Olean, N. Y., has completed arrangements for doubling the capacity of its plant on North Union street. Two 200-hp. gas engines will be installed together with new generators and other duplicate machinery.

The Lupton Utility Company has been incorporated, with a capital stock of $50,000, by Lupton and Denver business men, to supply Lupton, Colo., with water, ice, electric light and power. The initial installation of the power plant will consist of a 100-hp. water tube boiler, a compound engine direct connected to 50-kw. generator, switchboard, electric water pump and auxiliary apparatus. A 100,000-gallon triplex pump, driven by three-phase induction motor, will be installed for pumping the water, and the ice plant, which will be put in in the spring, will have a capacity of 6 tons a day. The officers are: President, D. H. Rice, vice-president of the Consolidated Engineering Company, Denver; vice-president, T. C. Winbourn, Lupton; treasurer, W. J. Westfall, Denver; secretary, George R. Vickroy, Lupton, and manager, E. J. Stanton, Lupton.

Bridges and Buildings.

The Riter-Conley Mfg. Company, Pittsburgh, Pa., reports considerable improvement in business and that its structural shops are running full on the following work: 2500 tons of trestle work and storage pockets including coal docks for the Charlotte Dock Company, near Rochester, N. Y.; 1500 tons of steel for the 12-story Spaulding Building, at Portland, Ore., to be erected by Jas. T. Stewart; 1000 tons of steel for a tube mill for the Bridgeport (Conn.) Brass Company; 1500 tons of bridges for the Cincinnati, Milwaukee, & St. Paul Railroad; 3000 tons for the repair shops and extensions for the Chesapeake & Ohio and Chicago, Burlington & Quincy railroads. The Riter-Conley Mfg. Company is now completing eight blast furnaces for the Indiana Steel Company, at Gary, Ind.; also the three blast furnaces for the Jones & Laughlin Steel Company in Aliquippa, Pa., and has recently booked about 6000 tons of blast furnace work, much of which is for export. It has several large blast furnace jobs pending. Erection is now being made of a hydro-electric installation in Colorado, the feeders for which are said to be of heaviest construction, to stand an 1800 ft. head of water, and are partly made up of plates nearly 2 in. thick, which are first rolled in cylindrical form and riveted; also 5000 tons of plate work up to 10 ft. diameter for hydro-electric stations in South America and Mexico. Galvanized towers for carrying high potential wires for power transmission involving a large tonnage of steel are being built for shipment to Georgia, Brazil and Central America. The welded steel plate work is also a new and growing industry. Work in hand includes buoys for United States Government, pipe of large diameter and tanks for use as transformers in addition to orders for a number of kilns for the Universal Portland Cement Company.

Fires.

The plant of the Western Wheelbarrow & Mfg. Company, Kansas City, Kan., was destroyed by fire August 23. The loss is placed at $80,000.

The pulp mill of William Johnston at Chateaugay, N. Y., was burned August 31, the loss being about $40,000.

The plant of the Hillside Coal & Iron Company at Dupont,

near Wilkes-Barre, Pa., was destroyed by fire August 24. The loss is estimated at $50,000.

The wrench factory of William H. Jorth & Co., Jamestown, N. Y., was damaged by fire August 28 to the extent of $5000.

Hardware.

A concern which has already felt the increase in business to such an extent as to necessitate the increase of its productive capacity is the Madden & Morrison File Company, Middletown, N. Y. Ground is being broken for an extension of the main factory building which when equipped will increase the capacity of the plant by about 25 per cent. This company was formerly known as the Madden File Company and has been manufacturing files and rasps in Middletown since 1857.

Miscellaneous.

The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., is now occupying its new steel building, about 150 x 250 ft., two stories, which is devoted to dipping, drying and fusing. The company manufactures porcelain enameled iron signs of all styles and colors, refrigerator linings, &c. It reports business so good that it is compelled to operate its furnace department at night, besides having several other departments on double turn. The company also reports increased business in porcelain enameled iron signs for manufacturing plants, some of the larger concerns using them being the American Bridge Company, American Sewer Pipe Company, Riter-Conley Mfg. Company and others.

The Pittsburgh Galvanizing Company, Twenty-sixth street and Allegheny Valley Railroad, Pittsburgh, has received an order for 500 tons of galvanized angles and channels for shipment abroad. The company is operating its plant to full capacity.

The Pressed Radiator Company of America, Bailey-Farrel Building, Pittsburgh, Pa., is sending out to the trade a folder showing illustrations of a few of the prominent buildings equipped with Kinnear pressed radiators. Among these are the Singer Building, New York; Capital Savings & Trust Building, Columbus, Ohio; Montgomery-Ward Building, Kansas City, Mo., and the White Building, Seattle, Wash. The advantages of the Kinnear pressed radiator are also set forth in the folder.

The Pittsburgh Feed Water Heater Company, Twenty-sixth street and Liberty avenue, Pittsburgh, has recently increased its capital and reorganized by electing the following directors and officers: E. D. Graff, president; J. E. Schlieper, vice-president; Jos. F. Guffey, treasurer; C. E. Greenfield, secretary, and S. S. Stewart. The latter besides being a director has the Pittsburgh sales agency of the company, being located in the Park Building in that city. The company manufactures feed water heaters of the open and closed type, either vertical or horizontal.

At a special election recently held in the village of Cold Springs, Minn., the citizens of that place voted a bond issue of $11,000, the proceeds of which are to be used for the installation of a water works and sewerage systems.

W. S. Baertich, Troy, Ind., is organizing a company to install a water system to cost about $10,000.

Archer, Rollins & Co., Kansas City, Mo., are at work on plans for a pump house and water distribution system for Gotebo, Okla.

The Iowa Mfg. Company, Oskaloosa, Iowa, has started work on a large addition to its plant.

The Detroit Wire Spring Company, Detroit, Mich., will erect a new brick factory, 81 x 200 ft., one story, on Marston avenue, between Morrow and St. Aubin avenues.

The National Motor Car Company, Indianapolis, Ind., is receiving bids for a two-story addition to its factory building, to cost $25,000.

The Crescent Forgings Company, Pittsburgh, plant at Hulton, Pa., is again employing all of its old workmen and operating its forces overtime. It manufactures Cresco pipe wrenches and general drop forgings.

The Covert Motor Vehicle Company, Lockport, N. Y., awarded contracts last week for two additional buildings to be erected in connection with the large machine shop already under way for the manufacture of gears, transmission and axles for automobiles. The main building, which is already under way and will be ready to occupy in 30 days, is two stories, 130 x 150 ft. The later two buildings consist of a furnace and blacksmith shop, 16 x 40 ft., and a storage building, 16 x 130 ft. Orders have already been placed for a quantity of equipment, consisting of Pratt & Whitney and Landis grinders, Gisholt and Jones & Lamson turret lathes and Fitchburg low swing lathes. The company is still in the market for one special duplex double milling machine. For the coming year the company will continue to operate the present plant in connection with the new plant under construction.

The recent statement in these columns concerning the new additions to be built to the plant of the Maryland Portland Cement Company at Security, Md., was slightly in error. The company is to start construction work on the building at once, and the output of the plant will be increased to 2000 bbl. a day instead of 1800 bbl.

The Wm. G. Elbs Company, paper manufacturer, Rochester, N. Y., has plans out and is receiving bids for a brick and steel paper mill plant, to include four buildings, two stories, 44 x 189 ft., 34 x 124 ft., with wing 44 x 99 ft., and power house, 43 x 75 ft., respectively. Work on construction will be started within the next 30 days.

The American Metal Door Company is arranging to move its plant from Jamestown, N. Y., to Bradford, Pa., where a factory building with railroad switching facilities has been secured.

Water works will be constructed by the city of Teague, Texas, a centrifugal pumping unit probably being used.

The Latin-American Machinery Trade.

Alfred J. Thompson, 71 Broadway, New York, who, prior to 1893, was in the laboratory of Thomas A. Edison for four years, and since then has devoted his entire time to the sale, installation, and operation of American machinery in Latin-American countries, announces that he has formed a selling organization to handle business in that rapidly developing part of the Western hemisphere. During the past 16 years he has lived in and traveled extensively through Cuba and every republic of South America and has established most pleasant personal relations with their largest consumers. Among the various plants he sold and installed were the municipal electrozone plant at Havana, the United States military hospital plant, the power plant for the Havana Iron Works, the electric and disinfecting plant on the United States Steamship Protector, stationed in the Caribbean, &c. Among his Peruvian interests are the Tamborque smelter and the Huaraucaca smelter and he is now completing details for the equipment of the Seboruco and Cicapra smelters in Venezuela.

He has found that one of the principal reasons for not getting our full share of this business, especially in the mechanical and machinery lines, is the fact that the agents or representatives do not appear to have sufficient technical training or knowledge of either United States shop conditions of manufacture or the duty of the machinery required. The few American salesmen who have attempted to canvass this extensive and profitable trade have generally been commission men with too varied a line. To handle efficiently a line of mechanical goods, Mr. Thompson has associated with himself, in each of the capital cities, a graduate engineer who makes his home there and who knows the conditions of service and technical requirements of the local market. To keep in close touch with the trade, frequent visits are made to the extensive mining plants, railroad shops and other principal users of our product. The organization will have its headquarters in New York and Mr. Thompson will make periodical trips to the several countries to call on his resident representatives and secure advanced information bearing on local conditions. His traveling associates all speak Spanish, and have had an extensive shop training in the United States and selling experience in Latin-America.

British Iron Ore and Coal Production in 1908.

The official statistics of the production of coal, iron ore, manganese ore and tin ore in Great Britain in 1908 are given below.

The production of coal amounted to 261,528,795 gross tons, as compared with 267,830,962 tons in 1907, a decrease of 6,302,167 tons. The maximum production was reached in 1907.

The total production of iron ore was 15,031,025 tons, as compared with 15,731,604 tons in 1907, a decrease of 700,579 tons. In addition 4295 tons of bog ore was produced in Ireland in 1908. The imports of iron ore and manganiferous iron ore in 1908 amounted to 6,057,071 tons, as compared with 7,641,934 tons in 1907.

In 1908 the production of manganese ore amounted to 6308 tons, as compared with 16,098 tons in 1907. The maximum production was, in 1906, 22,762 tons.

The production of dressed tin ore in 1908 was 8008 tons. In 1884 it amounted to 15,117 tons. Since that year it has gradually declined.

The Iron and Metal Trades

There have been some interesting movements in iron ore recently. It is estimated that during the past five weeks there have been sales of fully 600,000 tons of Lake ores in the Central West, all for this year's delivery, at $3.50 for non-Bessemer Mesaba and $3.70 for non-Bessemer old range ores.

In the East there have been sales recently of 250,000 tons of Wabana ore, following the placing of contracts for Spanish and Swedish ores. It is estimated that the importation of foreign ore next year, outside of the ore which goes to the steel companies, chiefly Cuban, will figure up 1,000,000 tons. In fact, it looks as though very little Lake ore will be taken by the furnaces in the territory east of the Alleghenies.

There has been further activity in pig iron throughout the country, and considerable purchases have been made, both for this year's and next year's delivery. The leading Southern interest has opened its books for 1910 at $14, Birmingham, for No. 2, but as yet no heavy tonnage appears to have been placed. In eastern Pennsylvania foundry iron for this year's delivery has advanced further and is now firm on the basis of $17 for No. 2 at furnace. There have been round sales for delivery well into 1910 to New England melters. In the Buffalo District $15.75 is now the minimum, but some of the leading interests are asking more. Negotiations for round tonnages are pending in that district. The leading holder of Virginia foundry has advanced its price to $15, at furnace.

Steelmakers in eastern Pennsylvania have been short of spot basic iron, and one block of 1500 tons of Western iron was taken at $18, delivered. There were other sales of prompt basic aggregating about 10,000 tons at prices rising from $17.50 to $18. For next year two lots aggregating 22,500 tons were purchased at $18, delivered.

The feeling is growing that the advance in pig iron has been somewhat rapid, and that the views of a considerable number of the makers are extreme. The English warrant market has hardened and is now at 54s. 6d.

Large consumers are beginning to put out feelers for next year. Indicative of this is an inquiry from a large user of cast iron pipe in the Central West which calls for 22,000 tons. A good deal is expected of the railroads in the way of purchases for next year, and some important rail sales are on the eve of being closed. The Atchison, Topeka & Santa Fé company, which has contracted for 130,000 tons of rails and 45,000 tons of tie plates, has added 12,000 tons to the rail order. The Southern Railroad has allotted 40,000 tons in all. The Chicago & Great Western has taken 12,000 tons, a frog and signal company 10,000 tons, the Lake Shore & Michigan Southern 5000 and the Baltimore & Ohio 3000 tons.

Car orders continue to come out. The Pressed Steel Car Company has ordered 300,000 car axles from the Carnegie Steel Company.

Structural work recently has been secured chiefly in the West. In Chicago, the Brooks building calls for 2100 tons, the Harris Trust building for 5600 tons, a bank building at Spokane, 2750 tons, railroad shops at Brewster, O., 1800 tons, and a bridge at Duluth, 4500 tons.

There is quite some figuring going on for freight boats for the Lakes. The Great Lakes Engineering Company has accepted three boats, for which the material, 8000 tons, has not yet been placed.

The scrap situation is becoming decidedly interesting. Heavy melting steel scrap is in particularly strong demand, and prices have advanced sharply at Pittsburgh and Philadelphia under the pressure from consumers for additional supplies. The urgent needs of some of the Eastern steel companies, recently associated for the purpose of buying through one agency, have broken through the price on steel scrap which was expected to be the maximum paid, and one large lot, said to be about 25,000 tons, has been bought at about $18 delivered.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 1, 1909.	Aug. 25, 1909.	Aug. 4, 1909.	Sept. 2, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	**$17.75**	$17.25	$16.75	$16.50
Foundry No. 2, Southern, Cincinnati	**16.75**	16.75	16.25	15.50
Foundry No. 2, local, Chicago	**18.50**	17.50	17.00	17.35
Basic, delivered, eastern Pa.	**18.00**	17.50	16.50	15.25
Basic, Valley furnace	**15.50**	15.25	15.25	14.50
Bessemer, Pittsburgh	**17.65**	17.40	16.90	15.90
Gray forge, Pittsburgh	**15.65**	15.65	14.90	14.65
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	**25.00**	24.50	24.00	25.00
Forging billets, Pittsburgh	**29.00**	28.00	28.00	27.00
Open hearth billets, Philadelphia	**27.50**	27.00	27.00	26.20
Wire rods, Pittsburgh	31.00	31.00	31.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**16.00**	16.00	15.25	15.00
Steel rails, melting, Philadelphia	**17.25**	17.00	16.50	15.25
Iron rails, Chicago	**19.00**	19.00	17.50	16.75
Iron rails, Philadelphia	**20.00**	19.75	19.50	20.00
Car wheels, Chicago	**17.00**	17.00	16.00	16.00
Car wheels, Philadelphia	**16.50**	16.00	15.00	15.00
Heavy steel scrap, Pittsburgh	**17.25**	16.75	16.00	14.25
Heavy steel scrap, Chicago	**15.50**	15.50	14.75	13.00
Heavy steel scrap, Philadelphia	**17.25**	17.00	16.50	15.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	**1.50**	1.47	1.45	1.45
Common iron bars, Chicago	**1.40**	1.40	1.37½	1.50
Common iron bars, Pittsburgh	**1.50**	1.50	1.45	1.40
Steel bars, tidewater, New York	**1.51**	1.51	1.46	1.56
Steel bars, Pittsburgh	**1.35**	1.35	1.30	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.76
Tank plates, Pittsburgh	1.40	1.40	1.40	1.60
Beams, tidewater, New York	1.56	1.56	1.56	1.76
Beams, Pittsburgh	1.40	1.40	1.40	1.60
Angles, tidewater, New York	1.56	1.56	1.56	1.76
Angles, Pittsburgh	1.40	1.40	1.40	1.60
Skelp, grooved steel, Pittsburgh	**1.40**	1.40	1.35	1.45
Skelp, sheared steel, Pittsburgh	**1.50**	1.50	1.45	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh	1.75	1.75	1.75	1.80
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.40
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.50	13.50	13.50	13.87½
Electrolytic copper, New York	**13.25**	13.25	13.00	13.75
Spelter, New York	**5.85**	5.85	5.60	4.75
Spelter, St. Louis	**5.70**	5.70	5.45	4.60
Lead, New York	**4.40**	4.40	4.35	4.57½
Lead, St. Louis	**4.30**	4.32½	4.20	4.45
Tin, New York	**30.25**	30.45	29.50	29.00
Antimony, Hallett, New York	**8.00**	8.00	7.50	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.64	$3.64	$3.64	$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c., net; I-beams over 15 in., 1.50c., net; H-beams over 8 in., 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.45c., net; angles, over 6 in., 1.50c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.60c., base, half extras, steel bar card; tees, 3 in. and up, 1.50c., net; zees, 3 in. and up, 1.45c., net; angles, channels and tees, under 3 in., 1.35c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.65c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken is base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼ in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.	.05
For widths over 100 in. up to 110 in.	.05
For widths over 110 in. up to 115 in.	.10
For widths over 110 in. up to 115 in.	.10
For widths over 115 in. up to 120 in.	.15
For widths over 115 in. up to 120 in.	.15
For widths over 120 in. up to 125 in.	.25
For widths over 120 in. up to 125 in.	.25
For widths over 125 in. up to 130 in.	.50
For widths over 125 in. up to 130 in.	.50
For widths over 130 in.	1.00
For widths over 130 in.	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c.; Galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.25c.; No. 30, 3.60c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized roofing sheets, No. 28, $2.80 per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, ¾ to 6 in., are 77 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1¼ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer, open hearth and chain rods, $31.

Steel Rivets.—Structural rivets, 1.80c., base; boiler rivets, 1.90c., base.

Chicago.

FISHER BUILDING, September 1, 1909.—(*By Telegraph.*)

The continuous influx of orders for finished material is taxing the capacities of the iron and steel mills and the question of price, usually of first importance, has given place in a large measure to that of deliveries, which in nearly all lines of rolling mill products are running far behind. During the past two years buyers have been accustomed to prompt execution of their orders, and the present congestion is in sharp contrast with conditions existing up to a short time ago. Added to the steady growth of demand of other industrial interests is the heavy volume of business now being contributed by the railroads. New rail orders are coming out, not only from the leading systems, but from traction lines, industrial roads and makers of track specialties. A notable feature of recent purchases is the proportion of open hearth rails called for. To the 130,000 tons of open hearth rails included in the Santa Fé's recent order there was added 12,000 tons of like specifications entered last week by the leading interest. The aggregate of rail orders entered in this market last week was 30,000 tons. Another feature of interest in railroad buying is the large tonnage of tie plates being placed. The Santa Fé's recent order for 45,000 tons of this specialty is in addition to very large purchases of the same kind made earlier in the year. The scarcity of steel is becoming quite pronounced. Local producers are hard pressed to supply their finishing departments. The new billet mill at Gary has been started, but is still in the trying-out stage, and is not yet a factor in regular production. All of the 14 open hearth furnaces now in operation at that plant are running on rail steel and the only ingots available for the billet mill are of high carbon. Preparations are being made to start six or seven furnaces in the No. 3 plant, which will furnish soft steel for merchant bar billets. A serious car shortage this fall, when the crops begin to move, is a contingency that is being faced by shippers with no little concern. The railroads, however, are making extraordinary efforts to meet the emergency by repairing equipment as rapidly as possible, and a repetition of the experience in the early part of 1907 is hardly likely to be realized.

Pig Iron.—Last week's market was characterized by a widely distributed demand in which no lots of exceptionally large size figured. There were but few individual purchases amounting to more than 500 tons. The orders placed were chiefly for first quarter delivery, very little iron being booked for shipment during the remainder of the present year. The market continues notably strong. Local Northern iron has advanced to $18.50, which price is being firmly held on all deliveries up to and including the first quarter of next year. Not much business has been placed at this price, which, however, has been in effect but a few days. The leading Alabama interest has opened its books for first quarter business at $14, Birmingham, in a selective way—that is to say, orders are not being entered indiscriminately for this period, but are being taken subject to furnace approval. So far as is known no Southern iron is being booked, nor are there any price schedules open for deliveries beyond the first quarter. Some business for shipments through to January 1 at $13.50 is still being done by several interests, but how much iron is available at this figure cannot be definitely determined. Some apprehension exists among producers that too rapid a pace may be set in advancing values which if carried too high will have the unwelcome effect of checking buying. There is an inquiry in the market from a local consumer for 5000 tons of standard Bessemer for this year's delivery. A leading steel foundry interest is taking figures on 500 to 1000 tons each of foundry ferrosilicon and Bessemer foundry silicon for early delivery. The general impression seems to be that melters are as a rule pretty well covered for fourth quarter requirements, but much depends upon the rate of increase in consumption between now and the first of the year. A marked expansion in the demand for foundry products would doubtless overreach present provisions and call for new purchases. The following prices are for September delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	19.00 to 19.50
Northern coke foundry, No. 2	18.50 to 19.00
Northern coke foundry, No. 3	18.00 to 18.50
Northern Scotch, No. 1	18.50 to 19.00
Southern coke, No. 1	18.35 to 18.85
Southern coke, No. 2	17.85 to 18.35
Southern coke, No. 3	17.35 to 17.85
Southern coke, No. 4	16.85 to 17.35
Southern coke, No. 1 soft	18.35 to 18.85
Southern coke, No. 2 soft	17.85 to 18.35
Southern gray forge	16.35 to 16.85
Southern mottled	16.10 to 16.60
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	18.90 to 19.40
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets and Rods.—Owing to the withdrawal of local producers from the market, consumers of billets are obliged to look elsewhere for their billet requirements. Under the circumstances Eastern mills constitute the only available source of supply, and in the absence of local quotations the only criterion as to values is afforded by Pittsburgh prices, which are quoted elsewhere. Manufacturers are specifying freely for wire rods, and some new contracts are being placed at the ruling prices of $32, Pittsburgh, for Bessemer and chain rods, and $33 for open hearth rods.

Rails and Track Supplies.—Further evidence of railroad activity is supplied by additional rail purchases aggregating 30,000 tons placed last week by various interests, most of which is for delivery during the present year. Included in these purchases is an order from a Western line for 12,000 tons of open hearth rails taken by the Illinois Steel Company; the same company also secured an order for 4000 tons from a Texas road and 10,000 tons from a frog and switch company, in addition to which several other orders of smaller size were entered. The Lake Shore & Michigan Southern placed about 5000 tons with the Lackawanna Steel Company. Enough business has now been booked by the local mills to insure their operation during the rest of the year, and the prospects for a heavy output in 1910 are highly encouraging. It is expected that in view of the rapidity with which rail business is piling up the roads will not delay the placing of orders for next year's delivery, but will anticipate their wants by placing contracts some time in advance. As noted in last report, orders for a considerable tonnage has already been placed by Western roads for forward deliveries. The larger part of the business included in these purchases was placed by the Santa Fé system, which distributed orders between Eastern and Western mills for 130,000 tons of open hearth rails for deliveries extending through to April, 1910. Orders were placed by the same system for 45,000 tons of tie plates. The demand for track fastenings is very heavy, and the mills are considerably behind in deliveries on track bolts, prices on which are firm at a minimum of 2.25c. to 2.30c. on square nuts, with the usual advance of 15c. for hexagon nuts. The Joliet mills are running full on spikes, but are able to make reasonably

prompt shipments. A somewhat brisker movement has developed in light rails, and prices continue firm at the following schedule: 40 to 45 lb. sections, $26; 30 to 35 lb. sections, $26.75; 16, 20 and 25 lb. sections, $27; 12-lb. sections, $28, Chicago, less 50c. a ton on lots of 500 tons and $1 a ton on lots over 500 tons.

Structural Material.—Business continues active and quite a number of contracts were closed last week, the aggregate being fairly large. Material for the Brooks Estate Building, Chicago, 2100 tons, will be fabricated by the Brown & Ketchum Iron Works, which secured the contract from the George A. Fuller Company, general contractor. Included among the orders taken by the American Bridge Company were 5610 tons for the Harris Trust & Savings Bank, Chicago; 4500 tons for a bridge being constructed by the Interstate Transfer Company over the St. Louis River at Duluth, Minn., and 162 tons for the Wyoming Building, Denver. The Minneapolis Steel & Machinery Company was the successful bidder on material for the Old National Bank Building, Spokane, 2764 tons, and an annex to the Bee Building, Omaha, 291 tons, went to the Paxton-Vierling Company. Contracts were secured by the McClintic-Marshall Construction Company for the erection of a new shop at Detroit for the American Car & Foundry Company, 92 x 1070 ft., 700 tons; also a paint shop for the Whipple Car Company, Chicago, 177 tons. An initial order of 70 tons has been placed for the Old Lost River irrigation project, Idaho, with the Central Bridge Company, Indianapolis; this will be followed by further purchases later on. The total amount of steel required for this work will depend upon the engineer's decision as to the route selected and character of construction. It is expected that the general contract for the new Sherman House, Chicago, about 5000 tons, will be let this week. Liberal specifications are being furnished by railroads, the Santa Fé especially having specified largely in excess of the quantity called for in its original contract. Early deliveries of fabricated work are difficult to secure from any source since the shops are generally booked well ahead. Mill deliveries, moreover, are running so far behind that material cannot be obtained promptly for new orders except from warehouse stocks. Prices of plain material continue firm, the minimum quotation being 1.58c., base, Chicago. A number of the independent mills are holding at 1.63c. base, Chicago.

Plates.—Increasing demands from all sources are crowding mill capacities to their fullest limits and deliveries are falling further and further behind. Instead of being limited to a few industries, as was the case some months ago, buying is now general among all users of plates. Even the boiler and tank shops, which were among the latest to feel the effects of the upward movement, are now coming into the market quite freely. The heaviest tonnage, however, is being supplied by the car shops and fabricating works. Deliveries on universal plates are running as far behind as those of structural material; the leading mills are not promising shipments on new orders inside of 10 to 12 weeks. The sheared plate mills are not quite so badly crowded, but are several weeks behind on rolling schedules. The Chicago, Rock Island & Pacific has placed an order with the Standard Steel Company for 1000 steel gondola cars, and with the American Car & Foundry Company for 250 flat cars, the material for which will be rolled by the Illinois Steel Company. The minimum mill price on plates is 1.58c., Chicago. Jobbers' stocks are being heavily drawn upon for current requirements, owing to the inability of consumers to secure prompt shipments from mills. Store prices are firming up, and the tendency is strongly toward a general advance.

Sheets.—But few, if any, mills are able to promise shipments of new orders earlier than October, and some are filled up beyond this date. Contract specifications are being supplied without any urging on the part of the mills, and the volume of new business is steadily increasing. Prices are firm at current quotations all along the line, and on blue annealed sheets $2 a ton advance over the nominal market is being asked. As the mills become more and more loaded with work, consumers are compelled to rely upon jobbers' stocks for their immediate wants, in consequence of which the business of such interests is rapidly expanding.

Bars.—In common with other heavy mill products, the demand for bars continues heavy and specifications on current contracts are being supplied at a rate in excess of mill capacities. Every mill in this district is going full, and deliveries earlier than 60 days from receipt of order are out of the question. Some producers, indeed, are not able to execute orders inside of 90 days. Under these conditions mill prices are naturally firm and values have been very nearly restored to the level which prevailed prior to th drastic reduction following the declaration of an open market early in the year, when the official price was 1.40c., Pittsburgh. The best price now being offered on steel bars is 1.53c., Chicago, and the tendency seems to be toward a still higher level. Bar iron is in good demand, and the market is firmly established at 1.40c., minimum, while some business is being placed at 1.45c., Chicago. The Blue Island Equipment Company, located at 124th street and the Illinois Central tracks near Blue Island, has just completed a new bar mill as an adjunct to its car construction and repair shops. The plant consists of one 10 in. and one 18 in. mill, and is expected to begin operations this week.

Merchant Pipe.—The demand from Western jobbers, while not so insistent in this line as in some other branches of finished material, is of fairly large volume. No complaint is heard of delayed deliveries, though the indications point to the development of less satisfactory conditions in this respect, as the mills are gradually accumulating a large volume of business. Prices remain unchanged, though a revision of present discounts on an upward scale is not an improbable contingency of the near future.

Boiler Tubes.—A gradual expansion of demand is observed, though mill orders for both merchant and locomotive tubes are of moderate volume. Some delay in the execution of orders, especially in seamless tubes, is experienced, though it is not of such extent as to occasion serious inconvenience. Jobbers report a very satisfactory movement in store stocks, which are ample to supply the immediate requirements of consumers.

Cast Iron Pipe.—The market is fairly well supplied by numerous orders from small municipalities. A number of such lettings ranging from 100 to 400 tons have been closed during the past week. These represent chiefly the requirements of Western towns for new plants and extensions. There are no large lots in sight for early closure, and not much heavy buying is expected until later in the season, when the larger cities begin to come into the market for next year's deliveries. The upward trend of pig iron is responsible for a firmer tone in prices, which, if continued, may in the near future take the form of an actual advance. We quote per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16-in. and up, $25.50, with $1 extra for gas pipe.

Metals.—While there has been little doing in the way of actual sales, inquiries for copper are more numerous and are of a character that indicates an early buying movement of greater or less extent. A good many of the larger consumers have been covered by contracts placed some time ago which will expire September 1, and since consumption has been growing in volume it is argued that heavier purchases will be required to meet current requirements. Copper prices, though firmer in tone, have not yet moved up. Tin is higher and the market is unusually active. Lead and spelter are steady at ruling quotations, but a rising tendency in the latter metal is noted. Old metals are quiet, and the market is without features of special interest. Quotations are as follows: Casting copper, 13¼c.; lake, 13¾c. to 14c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 32½c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; spelter, 5.75c. to 5.85c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11½c.; copper clips, 12¼c.; red brass, 11½c.; yellow brass, 9¼c.; light brass, 6¾c.; lead pipe, 4½c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—Although there is a fairly even demand for all grades of scrap, no buying movement of special significance has developed in any direction. Dealers are not pressing for business to the extent of offering substantial price inducements to influence orders, the general feeling being that better prices will be realized by holding a little longer. The fact cannot be ignored, however, that values have already risen to a level that will permit of a substantial profit on yard stocks that have been held for some time, and further advances will doubtless invite a general unloading. A good deal of such material has already been disposed of by dealers, but the continued strength of the market is against a general selling movement just now. The attitude of dealers is indicated by the fact that, instead of selling track consignments upon arrival at the best price obtainable, they are taking it into stock. Practically all of the rolling mills have surplus stocks sufficient to carry them for some time, and are not compelled to come into the market for current needs. They are all buying more or less as opportunity offers, but under the circumstances are not likely to follow the market up to a much higher level. Melting steel and cast scrap are in good demand. A list closed last week by the Burlington is said to have brought good prices. A lot of 300 tons of No. 1 wrought brought $15.15 on connecting line and $17.25 was offered for car wheels. The Rock Island is offering about 2700 tons this week. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails	$19.00 to $19.50
Old steel rails, rerolling	16.75 to 17.25
Old steel rails, less than 3 ft	16.00 to 16.50
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheel	17.00 to 17.50
Heavy melting steel scrap	15.50 to 16.00
Frogs, switches and guards, cut apart	15.50 to 16.00
Shoveling steel	14.25 to 14.75

The following quotations are per net ton:

Iron angles and splice bars	$18.00 to $18.50
Iron car axles	20.50 to 21.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Springs, knuckles and couplers	14.75 to 15.25
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	12.25 to 12.75
Steel axle turnings	10.75 to 11.25
Machine shop turnings	9.25 to 9.75
Cast and mixed borings	6.50 to 7.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	11.00 to 11.50
No. 1 cast scrap	14.50 to 14.75
Stove plate and light cast scrap	12.00 to 12.50
Railroad malleable	14.25 to 14.75
Agricultural malleable	12.00 to 12.50
Pipes and flues	11.25 to 11.75

Pittsburgh.

PARK BUILDING, September 1, 1909.—(*By Telegraph*).

Pig Iron.—Inquiries for pig iron are active, but actual sales the past week have been light. Three inquiries are in the market from the East, each for 5000 tons of basic, and a Chicago steel maker is also inquiring for 5000 tons of basic for any deliveries the furnaces care to make. The average price of actual sales of Bessemer pig iron in August was $16.234, and the average price of basic iron for August on actual sales was $15.268, both at Valley furnace. The whole pig iron market is very strong and indications point to higher prices. We quote as follows: Bessemer, $16.75 to $17; basic, $15.50; No. 2 foundry for this year's delivery $15.50 to $15.75, for first quarter of next year $16 to $16.25, and for second quarter $16.25 to $16.50; gray forge, $14.75 to $15, and malleable Bessemer, $15.75 to $15.90, all at Valley furnace, the freight to Pittsburgh being 90c. a ton. Sales are reported of 5000 tons of Bessemer for August, September and October at $15.75; 1000 tons of gray forge at $16; 300 tons of No. 2 foundry for last quarter at $16; 250 tons for first quarter at $16.25, and 1500 tons of No. 2 foundry at $16.50, all at Valley furnace.

Steel.—It is almost impossible to obtain any kind of reasonably early deliveries on billets or sheet and tin bars. The market is evidently facing a serious shortage in these lines. While most consumers are covered by contracts, there is a good deal of inquiry, and 4 x 4 in. open hearth billets are reported to have sold above $25, Pittsburgh. We quote Bessemer billets at $25 to $25.50, open hearth billets $25.50 to $26, and forging billets $29, all at Pittsburgh, actual freight to destination added. Sheet and tin bars in long lengths are firm at $26.50 to $27, Pittsburgh. Standard 4 x 4 in. Bessemer billets and slabs are sold at $25, minimum, while sheet and tin bars and billets, smaller than 4 x 4 in., are held at $26, minimum, f.o.b. cars Youngstown, actual freight to destination added. Sales are reported of about 3000 tons of 4 x 4 in. Bessemer billets at $24, Youngstown.

Coke.—A sale of 50 cars of Mount Pleasant blast furnace coke has been made for prompt shipment at $2; also a sale of 6000 tons of standard Connellsville furnace coke for prompt shipment at $2 per net ton, at oven.

Merchant Pipe.—Effective September 1, the National Tube Company and other pipe mills have made an advance of $2 a ton on all kinds of oil country goods. No advance in prices has yet been made on merchant pipe or boiler tubes.

(*By Mail.*)

General conditions in the steel trade continue very active. The demand for pig iron, steel and finished products is excessively heavy, with indications of advances in prices on some lines early in September. About a week ago boiler and structural rivets were advanced $2 a ton and blue annealed sheets $1 a ton. It is not improbable that prices on plain structural material, plate and steel bars will be advanced at least $1 a ton within the next week or 10 days. The strike at the McKees Rocks Works of the Pressed Steel Car Company is still unsettled, and indications are now that the trouble will have to be submitted to arbitration. This proposition was made by the men when the strike started, but was refused by the company, and it is the general opinion that a serious mistake was then made. The large steel concerns are getting back in deliveries, the Carnegie Steel Company being six weeks behind now on shipments of structural material and plates, while others are pretty well filled up for the balance of the year. Several of the leading steel companies will not sell ahead for a longer period than 90 days at present prices, and some will only sell for 60 days. Specifications against contracts continue to come in freely, and August was the record breaker in the matter of shipments.

Ferromanganese.—The recent advance in prices is firmly held and new demand continues heavy. We note sales of 500 to 600 tons of foreign 80 per cent. for balance of the year delivery at about $43, seaboard, or $44.95, Pittsburgh. A local interest is about to close for 150 tons for shipment over the rest of the year. We quote 80 per cent. foreign at $43 to $44, seaboard, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—The demand is active and we note sales of 75 to 100 tons of 50 per cent. for prompt delivery at about $63, Pittsburgh. We quote $23 for 10 per cent. blast furnace ferrosilicon, $24 for 11 per cent., and $25 for 12 per cent., while 50 per cent. is now held at $64 to $64.50, f.o.b. Pittsburgh.

Muck Bar.—Prices are very firm, one producer quoting all pig iron muck bar at $29, Pittsburgh, and will not shade that price. The demand is fairly active and there is an inquiry in the market for 1000 tons for shipment over the next three months. We quote best grades of muck bar, made from all pig iron, at $28 to $28.50, Pittsburgh.

Skelp.—We note additional heavy sales of sheared iron plates for forward delivery, amounting to 3000 to 4000 tons, at 1.80c. to 1.85c., Pittsburgh. The mills rolling skelp are filled up for some time ahead and buyers are specifying freely against contracts. We quote grooved steel skelp at 1.40c. to 1.45c.; sheared, 1.50c. to 1.60c.; grooved iron, 1.65c. to 1.70c., and sheared iron plates, 1.80c. to 1.85c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—While a number of Eastern and Western roads are making up their schedules of tonnage of rails needed for next year, very few contracts have yet been placed here. The Carnegie Steel Company is receiving specifications against contracts for rails for this year's delivery, but took no important new contracts for standard rails in the past week. It entered orders and received specifications against contracts last week for about 2100 tons of light rails. It has also received an order from the Pressed Steel Car Company for 300,000 steel axles to be rolled at its Homestead works. Steel axles are very firm at 1.65c. to 1.70c., and splice bars are also very firm at 1.50c., Pittsburgh. We quote light rails as follows: 12 lb., $30; 16 and 20 lb., $29; 25 lb., $28; 30 and 35 lb., 40 and 45 lb., $27, f.o.b. Pittsburgh. We quote standard sections at $28 at mill.

Plates.—Formal contracts for the plates and shapes for the two new battleships, Arkansas and Wyoming, have not yet been placed. Each will require 12,000 to 13,000 tons of plates, shapes and bars. The Great Lakes Engineering Works has secured a contract for three new boats, for which the plates and shapes have not yet been bought. New orders are piling into the plate mills at a rapid rate, and already the leading plate mills are from four to six weeks behind in deliveries. The minimum price of ¼-in. plates is 1.40c., Pittsburgh, but several mills are quoting 1.45c.

Structural Material.—A good deal of new work has been placed in the past week, and inquiries are very active. The American Bridge Company has taken 1800 tons for the new shops of the Wheeling & Lake Erie Railroad at Brewster, Ohio. The McClintic-Marshall Construction Company has taken about 600 tons for a 12-story office building to be built by the Standard Oil Company in this city. The Riter-Conley Mfg. Company has secured orders for about 8000 tons of steel for bridges and buildings and reports numerous other jobs on which it is bidding. Prices for fabricating are steadily improving, and several of the leading structural concerns are refusing to bid on some jobs, being practically filled for the balance of the year. The minimum price on beams and channels up to 15-in. remains at 1.40c., Pittsburgh, but one or two mills are quoting 1.45c.

Tin Plate.—August was the best month in two years of the American Sheet & Tin Plate Company in sheet and tin mill products, actual orders in August being 27,000 tons heavier than in any other one month for that time. It is now operating 142 hot tin mills out of 221 serviceable mills. So far as can be learned, no tin plate has been sold for delivery next year. The American Sheet & Tin Plate Company has not announced what its price will be. All the tin plate mills are filled up with business for practically the balance of the year, and in some cases are asking and getting premiums of 10c. to 15c. a box for delivery within the next month or six weeks. We quote tin plate at $3.40 per base box for 100-lb. cokes, f.o.b. Pittsburgh.

Sheets.—In actual orders sent to the mills, August was the heaviest month in two years of the American Sheet & Tin Plate Company, and it is now operating 145 hot sheet mills, with only 34 idle. It is preparing to start another sheet mill plant within the next week. New prices recently announced by the American Sheet & Tin Plate Company on blue annealed sheets are as follows: Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c., and Nos. 15 and 16, 1.85c. The independent sheet mills report business very active, with prices absolutely maintained at 2.20c. for No. 28 black and 3.25c. for No. 28 galvanized. Roofing sheets are $1.55 per square for painted corrugated, 2½-in. corrugations, and $2.80 for galvanized corrugated. Jobbers charge the usual advances over these prices for small lots.

Bars.—Trade continues very active, the new demand being fairly heavy, while specifications against contracts are coming in so fast that the mills are already from six weeks to two months behind in deliveries, and conditions in this respect seem to be getting worse. All the leading bar mills are filled up with orders and specifications for the next 60

to 90 days. The Carnegie Steel Company is still quoting 1.35c. on steel bars, but Republic, Jones & Laughlin and Cambria are quoting 1.40c. Iron bars are in active demand and specifications against contracts are coming in freely. Iron bars are held at 1.50c. minimum, f.o.b. Pittsburgh.

Hoops and Bands.—New business is active and specifications against contracts are coming in very freely. We quote hoops at 1.45c. minimum, this price being made by only one or two makers, the general market being 1.50c. to 1.55c. Bands are 1.35c. to 1.40c., with steel bar card extras.

Shafting.—New orders are coming in well, and consumers are specifying liberally against contracts. The shafting departments of the Republic and Jones & Laughlin companies are operating double turn, and both are somewhat behind in deliveries. We quote cold rolled shafting at 60 per cent. off in carloads and 55 per cent. in less than carloads delivered in base territory. It is stated that these prices are being absolutely maintained.

Spikes.—There is liberal buying of spikes by the railroads, but usually in small lots. The spike makers are now operating practically to full capacity and have a good deal of business ahead. The tendency of prices is toward higher figures, and an advance in the near future is predicted. We quote $1.65 for railroad spikes, 4½ x 9-16 in. and larger, and for smaller sizes and boat spikes, $1.70, base, subject to standard card extras, with an advance of 5 per cent. in less than carload lots.

Rivets.—Through an oversight the advance of $2 a ton in structural and boiler rivets made by the manufacturers August 17 was not noted in this report last week. The demand for rivets is very active, and the different makers report that they have more orders on their books at present than at any time in the past two years. We have advanced prices $2 a ton, and now quote 1.80c., base, for round head structural rivets, ½ in. and larger, and 1.90c., base, for cone headed boiler rivets, ½ in. and larger, f.o.b. Pittsburgh, in carload and larger lots.

Merchant Pipe.—As yet there are no indications of an advance in prices of merchant pipe, but one or two mills are so well filled up with business that they are practically out of the market as sellers. Spang, Chalfant & Co., Inc., have taken the contract for 10 miles of 18-in. pipe for the Kansas Natural Gas Company, while the Monongahela Natural Gas Company is in the market with an inquiry for 15 miles of 16-in. All mills are practically filled up with business for the rest of this year, and an advence of about two points in prices in September is expected by the trade, but nothing official regarding this has yet been given out. The official discounts on black steel pipe, ¾ to 6 in., are 81 and 5, and on iron pipe, ¾ to 6 in., 77 and 5, in carload and larger lots to the largest trade.

Boiler Tubes.—Mills report that the new demand for merchant and boiler tubes is increasing, but as yet not enough business has been placed to give the mills making merchant and boiler tubes full work. The official discounts continue to be more or less shaded.

Iron and Steel Scrap.—The market continues very strong, and prices have shown a further advance, dealers being more anxious now to cover their shorts than to make new sales. The consumption of all kinds of scrap is enormously heavy, and it is picked up by consumers practically as fast as offered by the dealers. The scrap list of the Wheeling & Lake Erie, Pennsylvania lines West and the Erie close September 2, and bids have been higher on the scrap offered by these roads than for a long time. The New York Central list this month is heavy and closes on the 7th. We have again advanced prices slightly and now quote heavy steel scrap at $17.25 to $17.50; cast iron borings, $11 to $11.25; No. 1 cast scrap, $16; No. 2, $15; bundled sheet scrap, $15.25 to $15.50; No. 1 railroad malleable, $16 to $16.50; low phosphorus melting stock, $21 to $21.50; sheet bar crop ends $18.50 to $19; grate bars, $13 to $13.50; steel axles, $21.50 to $22; rerolling rails, delivered Newark, Huntington or Cumberland, $17.50; locomotive tires, $19 to $19.50; locomotive axles, $26 to $26.50; old car wheels, $17.50; machine shop turnings, $13 to $13.25; iron axles, $26 to $26.50; No. 1 busheling scrap, $15; No. 2, $11.50 to $12, and No. 1 railroad wrought scrap, $18 to $18.25. All above prices are per gross ton, f.o.b., Pittsburgh, unless otherwise noted. Bundled sheet scrap is very strong in the East, and a good deal of this material is being sent there from Pittsburgh. We note sales of 650 tons of heavy steel scrap at $17.50, delivered; 6$$ tons of borings at $11; 500 tons of bundled sheet scrap at $15.50, delivered consuming point, and 700 tons of No. 1 cast at $16, Pittsburgh.

Coke.—Trade continues active, and prices on both furnace and foundry coke are higher. The project of consolidating a large number of coke plants seems to have been abandoned, as nothing more is heard of it. We quote standard Connellsville furnace coke for prompt delivery, or for shipment over the balance of the year, at about $2 per net ton, at oven, and standard makes of 72-hr. foundry at $2.25 to $2.35 per net ton, at oven. On a large furnace contract for the first half of next year, one leading maker of standard coke quoted as high as $2.35, at oven. The output in the Connellsville region last week was 397,979 net tons, a slight increase over the previous week.

Cincinnati.

CINCINNATI, OHIO, September 1, 1909.—(*By Telegraph.*)

Considerable activity is manifested in the iron and steel industries in this center. Southern pig iron has been sold for first quarter delivery next year in sufficient quantities to establish a quotation. Northern pig iron, for delivery in the first half of next year, has advanced 50c. per ton, after a liberal quantity was sold. The machine tool industries are getting behind on orders, and two large plants have instituted night forces. Specifications on contracts in the finished lines are heavy and some producers are advancing prices on bands and spikes. Accumulations of pig iron at southern Ohio furnaces are gradually decreasing.

Pig Iron.—A considerable tonnage of Northern iron, the product of southern Ohio furnaces, has been sold the past week for delivery over the first half of next year at $15.50 for No. 2 foundry, at furnace. The interest which has been credited with taking the bulk of this business has advanced its quotation to $16, and is believed to be fairly well sold up. Southern producers have taken some business for the first quarter of next year on the basis of $14, Birmingham, for No. 2 foundry, and this price appears to be becoming established as a quotable basis, although it is given out that orders are not solicited at this figure. While some fair lots have been sold, the largest transaction reported was the closing of a contract for 7000 tons of foundry iron by a Michigan melter, which went to a Northern furnace, and 2000 tons of Southern silvery on which the prices were not made public. Stocks in consumers' yards in this section are reported as rather liberal, and some low priced iron is being held up through inability of the consumers to take care of it. For the balance of this year Northern iron is quotable at $15.50 for No. 2 foundry, at furnace, and Southern iron at $13.50 for No. 2, at Birmingham. Consumers are apparently well covered for the balance of this year, and there is little inquiry for iron for such delivery or for prompt shipment, but furnaces are complacent and are not offering urgently, as any iron carried over will likely find a better market in the first quarter of next year. This view is based upon the fact that the sales for first quarter delivery are now being made on a higher level than prevails for shipment over the balance of this year. For prompt shipment and delivery over the next four months, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$17.25
Southern coke, No. 2 foundry	16.75
Southern coke, No. 3 foundry	16.25
Southern coke, No. 4 foundry	15.75
Southern coke, No. 1 soft	$16.75 to 17.25
Southern coke, No. 2 soft	16.75
Southern coke, gray forge	14.75 to 15.25
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	17.20
Lake Superior coke, No. 2	16.70
Lake Superior coke, No. 3	16.20
Standard Southern car wheel	22.25 to 23.75
Lake Superior car wheel	20.50 to 21.00

(*By Mail.*)

Coke.—The market appears to be growing stronger and quotations are assuming a wider range owing to the advances asked by some producers. In the Connellsville District, quotations for foundry coke range from $2 to $2.35 per net ton at oven, and furnace coke, for delivery over the first half of next year, from $2.10 to $2.50. In the Wise County District foundry coke is quoted from $2 to $2.25, and furnace coke at $1.65 to $1.75 for the balance of this year. Pocahontas foundry coke is quoted at $2 to $2.25, and furnace coke at $1.85 to $2 for this year's delivery. All prices are f.o.b. oven. There is a fairly good inquiry, but producers are slow in the consideration of long time contracts.

Old Material.—Some quotations are higher than last week and the market is firm, but irregular. Heavy melting steel is stronger and quoted higher. Borings are also a shade higher. Trade is quiet, but the undertone is strong and dealers are firm holders, although carrying liberal stocks. The following prices shows the range of dealers' quotations to consumers, f.o.b. Cincinnati:

No. 1 R. R. wrought, net ton	$14.50 to $15.00
Cast borings, net ton	8.00 to 8.50
Heavy melting steel scrap, gross ton	15.00 to 15.50
Steel turnings, net ton	9.00 to 9.50
No. 1 cast scrap, net ton	14.00 to 14.50
Burnt scrap, net ton	10.00 to 10.50
Old iron axles, net ton	18.50 to 19.00
Old iron rails, gross ton	15.75 to 16.25
Old steel rails, short, gross ton	14.00 to 14.50
Old steel rails, long, gross ton	15.00 to 15.50
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	14.50 to 15.50
Low phosphorus scrap, gross ton	14.00 to 14.50

Finished Iron and Steel.—Deliveries on contracts continue liberal and local agents are sending in heavier specifications from week to week. Mills are getting further be-

hind on deliveries and the jobbing trade is active, as manufacturers are frequently compelled to buy from stock. Steel bars are quoted at 1.35c., Pittsburgh, for carload lots. Agents representing independent mills report advances in spikes and bands. Hoops are apparently firmly established at 1.50c., Pittsburgh. A large inquiry for spikes from a railroad company is under consideration.

San Francisco.

SAN FRANCISCO, August 25, 1909.

The least favorable feature of this market is continued price cutting on the part of local merchants, on which the increasing firmness in other markets appear to have little effect. Otherwise the market shows further improvement, with increasing inquiries for nearly all lines of finished materials. Liberal orders are being booked for forward shipment, as it is almost impossible to get anything in large quantities for early delivery. Transactions in merchant pipe appear to be a little below the volume of last month, as the larger requirements of the oil fields for the near future have been filled, and the jobbing trade is only moderately active. Bookings of plates, however, show some increase, and inquiries for sheets are fully up to the recent average. Practically all the local fabricators are now in the market for structural shapes, with a steadily increasing inquiry for early shipment, as the local supply of raw material is rapidly decreasing. A heavy tonnage of bars has been ordered this month, and a number of buyers are in the market, while the difficulty of filling requirements for the near future is constantly increasing. Many small orders are being filled from warehouse stocks by the local jobbers, some of whom are selling at about mill prices. The movement of machinery has increased materially since the beginning of summer, and the numerous manufacturing projects being undertaken at present indicate continued activity. Several lots of finished steel and iron products are en route to this coast from foreign mills, and it is reported that large orders for foreign bars have been placed, to be delivered both here and at Los Angeles. Leading importers, however, express the belief that the quantity brought in will not be materially increased.

Rails.—Inquiries for light rails continue to come out in large volume from the logging and mining districts, and both merchants and mill representatives report large orders. The movement of standard sections is also increasing to a considerable extent, with a number of recent transactions involving a fairly heavy tonnage, in addition to numerous orders for small lots. It is reported that a moderate quantity of foreign rails has been ordered for the Hawaiian Islands, but there is little likelihood of foreign rails being shipped to this market.

Structural Material.—Owing to the limited supply of raw material carried by local fabricators for the last year, the growing volume of work and the increasing difficulty of getting prompt deliveries, large orders are now being taken by the rolling interests, and a heavier tonnage has been booked this month than for some time. Comparatively little new work is being given out at the moment, though new plans are rapidly coming up for estimates, and the delay in letting is doubtless due in part to the impossibility of completing work in the near future. All the Eastern fabricating interests are taking on new work with great reluctance, refusing all but particular classes of work, and prices are steadily advancing. Most of the local shops have contracts covering the next month or two, and find difficulty in getting deliveries of the raw material under 90 days, while some of them are having serious delays on contracts now under way. All indications point to increasing firmness of prices, and with even a fair proportion of the work in prospect the shops will be well occupied through the winter. The McClintic-Marshall Construction Company has taken a small bridge, requiring about 150 tons, for the Western Pacific. This railroad has used about 9000 tons for bridge work in this territory during the last year, and has a large amount of additional work in prospect. The contract for the Jean Parker school, about 400 tons, was let to the Ralston Iron Works of this city. The Western Iron Works has taken contracts amounting to about $121,000 for work at the San Queutin prison, and the Van Dorn Iron Works will furnish 800 steel doors for the same building. The Des Moines Iron Works has taken a number of jobs in California of late, principally for elevated tanks. Plans are now about ready for the St. Francis Hotel annex. A large steel frame elevator building is planned for Portland, Ore. Among the new plans for this city is a $125,000 steel frame church. Many small jobs are now coming up, and the increased activity in building within the fire limits will call for large quantities of structural material, though most of the jobs are too small for individual mention. No recent arrivals of foreign material at San Francisco are reported, but a large lot has just arrived at Portland from Antwerp.

Pig Iron.—Local foundry requirements are increasing to some extent, and the outlook is gradually improving, though few of the plants are working at anything like their full capacity. Cast iron for structural work is in about the same demand as for the last two or three months, the present increase of work being due to a better inquiry for machinery castings and the requirements of the city in connection with the water system. The volume of pig iron moving is slightly greater than for some time, but the demand is almost entirely confined to foreign iron, and with frequent arrivals the over supply on hand decreases very slowly. Prices are irregular and show quite a wide range. While the reduction of the tariff tends to depress prices, no definite readjustment has yet been effected, and the tone of the market is even firmer than it has been. Arrivals include 550 tons for San Francisco and 1500 tons for Seattle, Wash.

Cast Iron Pipe.—A number of small purchases have been closed in the last two weeks, but no large transactions have been reported for some time, and the total new tonnage is comparatively small. Most of the projects likely to come up in the near future are unimportant, and larger developments, while they are likely to be carried out within a year or two, are being held back for the present. Some additions are being made to water and gas systems across the bay, but the material used has been on hand for some time. The increasing population of several suburban districts, however, will necessitate extensive improvements, and plans are being developed by which the systems covering those sections may be materially increased. An order for about 60 tons of 4 to 6 in. pipe has been placed with a local firm by the town of Anaheim, Cal. The United States Cast Iron Pipe & Foundry Company has taken an order for 206 tons for Modesto, Cal. Salinas, Cal., is in the market for about 300 tons of 8 to 10 in. pipe, bids to be opened September 1. Bids for a large tonnage of special fittings for the San Francisco high pressure system have been rejected, and new proposals will be received August 30.

Merchant Pipe.—While the local market is still somewhat demoralized by the low prices quoted by some of the jobbers, many of the local merchants show increasing reluctance to take orders at the prices which have lately prevailed. Stocks on hand have been greatly reduced, and some inquiries are coming out for immediate delivery. The orders booked from the local trade in the last two weeks, however, have not been heavy. There has been a fair movemnt to the oil fields, but the orders from that source have been smaller than last month, and the total tonnage for the coast market shows some falling off. Conditions in this department are not considered very encouraging, as few new projects are now coming up which will require large quantities, and the prospect of new work in the oil districts is regarded as uncertain.

Old Material.—Old material has been unusually active on the Pacific Coast for the last few weeks, with heavy purchases by a number of manufacturing interests, and the heavy oversupply of both cast iron and wrought scrap which has been carried here for the last few years is now practically cleaned up. There remain on hand only a few piles of structural scrap, which will probably be shipped East. The Pacific Hardware & Steel Company has been a very large purchaser of old material, taking a heavy tonnage from a number of local dealers, and the material is now being shipped to its rolling mill at Portland, Ore., both by rail and steamer. A large lot of structural scrap which has been held at South San Francisco for the last two years has been sold to Southern interests. The prices at which these purchases were made are not definitely made public, but most of the cast scrap was held at $18 per ton for heavy and $16 to $17 for light. Quotations on wrought iron and steel scrap show considerable range, varying between $10 and $14, and some heavy structural scrap has been moved at about $10. The small lots remaining on hand are firmly held, and with the anticipation of a larger demand dealers expect to realize some advance over the current figures. Another ship is now loading steel scrap for the Atlantic Coast.

The Western Steel Works, a new concern, located at 313 Howard street, has installed a small plant for the manufacture of crucible steel castings, and arrangements are being made to enlarge the operations. The company, which is headed by A. Haase, has been working on a new process, which is said to be perfected.

The Standard Gas Engine Company's plant in East Oakland is being increased by the addition of a 15-ton cupola.

The Carman Mfg. Company, Tacoma, Wash., is enlarging its equipment for the manufacture of iron bedsteads.

The Rogers & D'Artenay Mfg. Company's machine shops at Sacramento were destroyed by fire August 19, causing a loss of about $15,000.

A large shipment of rails and railroad machinery for government improvements at Manila passed through San Francisco this week.

According to a report from Monterey, Mex., F. S. Pearson is planning to erect an electric process steel plant in the City of Mexico, under the name of the Mexico Steel & Chemical Company.

The Pacific Car & Foundry Company has been incorporated at Portland, Ore., with a capital stock of $1,000,000

by J. W. Reiss, W. H. Judson, E. W. Buxton and G. F. Martin. The company has taken over the W. F. Holman Car Mfg. Company of San Francisco, and has acquired a 20-acre manufacturing site at Richmond, Cal.

The John Deere Plow Company is preparing to erect a six-story warehouse covering a city block at Portland, Ore.

The German Iron Market.

BERLIN, August 21, 1909.

The situation in the iron trade has hardly grown better since my last report, though a few feeble rays of light have begun to penetrate the general gloom. So far as home factors are concerned there is little to report of an encouraging character. In its trade review a few days ago the Cologne *Gazette* described the market as nervous and without a clearly marked tendency amid various conflicting influences. It must be admitted, however, that a more hopeful feeling is manifesting itself in some quarters. The activity in the building trades has somewhat increased, though still at a very low ebb; and it is believed that building operations will be on a larger scale during the autumn months than now. The cheapness of money is giving encouragement to this view.

Another fact of a more tangible character is the increased financial operations of the mortgage banks, institutions which supply the money for the erection of new houses. These banks sold more of their bonds during the first half of the year than for a half dozen years, and with the money in hand they ought to be able to set the building trade on its feet again. In view of the state of suspended animation in which this trade has gone through the past two years, and the big increase of the population in that time, it is certain that house building on a large scale must begin soon.

Looking to America for Business.

Another ground for encouragement is the reduction of iron and steel duties in the new American tariff law. This has already led to some inquiries being made here by prospective American buyers regarding scrap iron, and semi-finished steel. These inquiries have as yet apparently led to no transactions, but it is believed that something may be done later on, as the revival of activity in the American market makes further progress. This American revival, moreover, is being watched with great hopes by German iron men, who calculate with certainty that it must sooner or later make itself felt strongly on this side; they note that it has already caused a rise in Scotch warrants at Glasgow, and otherwise favorably reacted upon the British iron trade. So far as the newly created tariff situation is concerned, however, German iron men, like other German business people, are afraid that the United States Government will apply the maximum scale of duties to German goods after next March, since they regard the outlook for a commercial treaty or trade arrangement as exceedingly uncertain.

The pig iron market has shown increased weakness since my last report, and prices have gone lower than ever. According to the market reviews iron has latterly been selling at five and six marks a ton below the prices that ruled about the end of June. The great mixed concerns have continued to operate their furnaces at full blast; hence the production of pig in July was greater than for any month since the end of 1907. It has now become so cheap that the smaller rolling mills which make their own supply are seriously discussing the advisability of blowing out their furnaces and of buying hereafter from the big mixed companies. These have been the chief movers in breaking the prices of pig. The case is reported that one of them recently contracted to deliver iron to a big Belgian consumer at the present phenomenally low prices till the middle of next year, and even to give him an option to continue taking it at those prices.

Pig Iron Prices Somewhat Steadier.

This seems, however, to have been an exceptional case, since the reviews of the market begin to note that the prices of pig have within a week or two grown somewhat steadier. A still more welcome piece of news is that yesterday's fortnight quotations of iron on the Duesseldorf exchange showed a rise for the first time in many months. English foundry was yesterday quoted at 70 to 71 marks, against 69 to 70 two weeks ago; English hematite at 76 to 77, against 76; Luxemburg foundry at 45 to 47, against 45 to 46. Spiegeleisen has been offered cheaper during the past few weeks. Even in the home market this price is said to be lower now than the price at which the last order for America was taken nearly two months ago. In the Siegerland District spiegeleisen grading 10 to 12 per cent. is now going at 59 to 60 marks. Whether the rise of prices yesterday at Duesseldorf means that the downward movement has at last been checked for good is uncertain. Only a few days ago the Cologne *Gazette* noted that the tendency of prices was still downward. It is admitted in the reviews that stock of iron at the furnace and with dealers have been increasing, and other journals besides the one just mentioned express doubt as to whether prices have touched low water mark.

In the home ore market few, if any, changes have occurred during the summer. The mines in the Siegerland region report lighter sales, although they have been operating for many months on a 40 per cent. restriction of output. Notwithstanding this heavy curtailment, stocks have been accumulating so seriously that some of the mines are contemplating shutting down wholly. A movement is on foot in that district to secure a protective duty on iron ore, the argument being that most of the mines are now down so deep that the expense of operation is unduly increased, and the mines are feeling more and more sharply the competition of Swedish and Spanish ores. The operatives themselves are interesting themselves in the movement and are preparing a petition to be submitted to the Reichstag. It is regarded as certain, however, that it will be wholly without result. Germany would hardly commit the mistake of laying a duty on ores at a moment when the United States has practically abolished it.

The American reduction, by the way, is much discussed in the German press; the view that it will lead to big imports from Sweden to the American coast cities is generally entertained. The imports of Swedish ores into Germany have not as yet been curtailed through the general strike in that country. It is said that the mining companies there still have on hand large stocks of ores already mined. The imports of Swedish ores were somewhat greater in the first half of the year than in the like period of 1908. A number of the big iron companies of the lower Rhine made a contract in July with English and Dutch shipping companies for the importation of 10,000,000 to 12,000,000 tons of Swedish ores, extending over the next three years. Spanish ores are firm and contracts for next year's delivery are being placed.

The Steel Syndicate's Operations.

The Steel Syndicate (Stahlwerks-Verband) has this week declared contracts for the last quarter of the year open at existing prices. This applies to its three fully syndicated products, semi-finished material, structural shapes and steel rails and ties. Its shipments in these in July were of about normal dimensions, though about 20,000 tons less than for June. The monthly summary given to the press by the management this week says that orders on hand are now about 300,000 tons greater than at this time last year. The home shipments of billets remain of about the volume hitherto maintained, but the calls for delivery of goods have been slightly better during the past few weeks. The foreign market has remained quiet, but within a week it has become more active, especially in heavy rails. Several large contracts in rails and ties were taken. The business in rails for mines continues to develop favorably, but Belgian competition is interfering with prices. Good contracts for grooved rails from home and foreign sources have been placed, and the outlook in this specialty is rather fair, but here, too, foreign competition controls prices. In structural steel the orders at the beginning of the month were about 75,000 tons more than at the like date of 1908, and the shipments for the first seven months of year were 174,000 tons above last year's movement.

The Syndicate has just issued its annual report for the year ended March 31 last. It shows shipments of 1,417,852 tons in the three lines of goods above mentioned, which was about 35,600 tons less than for the previous year. Shipments abroad amounted to 514,255 tons, against 269,324 tons in 1908; but the home market took only 903,597 tons, against 1,187,121 tons. These figures show that it was the foreign market that kept the big Syndicates's establishments almost as well employed as in 1908. The increased shipments abroad were wholly in steel material; more than 36 per cent. of what was produced by the Syndicate was exported, against about 18½ per cent. in 1908. On the other hand, the export business in rails and structural shapes was considerably smaller than last year.

The business in bars has been somewhat better for some weeks, but a part of the mills are still on the lookout for orders, and there remains sharp competition to get them, with a corresponding pressure upon prices. According to one of the reviews individual companies have orders for bars for four or five months ahead. Prices, as indicated, remain unsatisfactory. For the home market they range between 95 and 97 marks, though one report mentions figures running several marks below 95. Export business, it appears, can still be placed as low as 90 marks.

The Wire Business the Most Satisfactory

The wire and wire nail business continues to be about the most satisfactory line in the trade. Home business is pretty good, but foreign is still better. Export business is coming in briskly, and the orders assigned to the various manufacturers are up to their full allotments. The international aspects of the wire trade give occasion for some discontent, so far as the matter of organization is concerned. It is complained of that the Americans, under the existing international agreement, are getting most of the good orders, and it is reported that the European members will re-

quire that the Americans maintain higher prices. Trouble also comes from the Belgian works, which are demanding that nails and fine wire be exempted from the international agreement. They claim that, owing to the unsatisfactory state of business, they will otherwise not be able to live up to the agreement. The German members, it is said, have plainly given the Belgians to understand that compliance with their demand would be equivalent to the dissolution of the agreement; hence they must withdraw it, or expect that result to follow. A meeting has been called for September 30 to settle the matter.

The state of business in the hardware trade at Solingen is reported as somewhat better, although the brisk business in razors has subsided since the American tariff law went into effect. Good orders for various kinds of goods have been received from Brazil and British India.

St. Louis.

ST. LOUIS, August 30, 1909.

Building operations, as indicated by the number of permits issued, show unusual activity for the season. Local fabricators are busy in getting out structural material and architectural iron work. Jobbers of miscellaneous iron supplies report an active demand from St. Louis territory. Brokers and commission pig iron houses are well pleased with current business and the outlook for fall trade. Bank clearings are increasing and the demand from the interior for funds to move the crops is of good volume. The supply, however, seems to be ample for all legitimate purposes. While the heated term has been prolonged beyond the average and delayed some absentees from returning to the city, on the other hand buyers hav flocked to this market, notably from the Southwest, and jobbing houses are doing a large business in staple goods.

Coke.—Increasing firmness, owing to conditions in the principal producing region, and some improvement in sales and inquiries, together with more freedom in movement on contracts indicating larger consumption, all point to a marked appreciation in values in the near future. In fact, owing to advices from the Connellsville District, some brokers are now asking a slight advance, and none of the leading sellers is willing to entertain offers for round lots for extended delivery on the basis of prices that would have been accepted earlier in the month. One office reports instructions to ask an advance of 25c. per ton for shipment over the first half of 1910. It is believed that large consumers who made year's contracts will soon be in the market again, having made larger inroads on stocks than anticipated at the beginning of the year. We quote for prompt shipment standard 72-hr. foundry at $2.25; for shipment over the balance of the year, $2.35; for shipment first half 1910, $2.50, all per net ton at oven, Connellsville.

Pig Iron.—The principal interest in the pig iron market is centered in business for the first quarter of 1910. This is owing to the fact that most large consumers in St. Louis territory are filled up for the balance of the year. The possibility, if not probability, of a further marked appreciation in prices is also a factor in the situation. If a disposition on the part of outside speculators to enter the market again becomes apparent an active trade will ensue, only to be checked either by the further withdrawal of furnacemen or through prices being made which may be regarded as excessive. Inquiry among the principal offices develops that no prices on Southern iron are in effect here for the first half of 1910. For the first quarter some sellers quote $14 for No. 2 Southern foundry for a limited quantity. Under existing conditions, while inquiries are free—one-half of which apply to the first half of 1910—not much large business is being booked, but the demand for moderate sized lots ranging from 250 to 500 tons is good. In detail we mention some transactions for the week: Sales of 2700 tons malleable Bessemer to three customers; a round lot of high silicon; 2000 tons of malleable Bessemer for shipment over the first half of 1910; 2000 tons of Southern iron for shipment over the balance of the year; 1500 tons of Virginia iron for the same delivery; 1000 tons of Ohio malleable for shipment over the first half of 1910, and 800 tons of Lake Superior charcoal iron. While in one instance a leading producer declined an offer of $13.50, Birmingham, for No. 2 Southern foundry and several furnacesmen refuse to make firm quotations for any delivery, we quote $13.50 as the market for the balance of 1909 and $14 for first quarter 1910 for standard brands.

Lead, Spelter, &c.—The market for lead is quiet at 4.27½c., East St. Louis. Spelter is weak at 5.62½c., with indications of selling off. Zinc ore has declined and is offered at $49 per ton, Joplin base. Tin is ¼c. higher; antimony unchanged; copper 1-10c. lower. The demand for metals is fairly good, but the protracted hot spell exerts an unfavorable influence.

Old Material.—The leading dealers report an active demand which is now coming from all the consumers of scrap iron and steel, and in consequence the market is very firm, with higher prices asked for some items. The situation is ruling more favorable for business than at any time for a year and a half, with satisfactory indications for the future. There are no offerings to report on the part of the railroads. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft	15.00 to 15.50
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	17.00 to 17.50
Heavy melting steel scrap	15.00 to 15.50
Frogs, switches and guards, cut apart	15.00 to 15.50

The following quotations are per net ton:

Iron fish plates	$13.75 to $14.25
Iron car axles	20.00 to 20.50
No. 1 railroad wrought	15.25 to 15.75
No. 2 railroad wrought	14.25 to 14.75
Railway springs	13.75 to 14.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	7.50 to 8.00
No. 1 boilers, cut to sheets and rings	11.00 to 11.50
No. 1 cast scrap	13.50 to 14.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	10.75 to 11.25
Railroad sheet scrap	9.00 to 9.50
Railroad grate bars	10.75 to 11.25
Machine shop turnings	9.50 to 10.00

The St. Louis Car Works is building a number of cars for the Pan-American Railroad. It reported that the new owners have planned extensive improvements both to the roadbed and the rolling stock.

The Heine Safety Boiler Company has received permission to erect a one-story fireproof office building at 2449 Marcus avenue, to cost $25,000.

Buffalo.

BUFFALO, N. Y., August 31, 1909.

Pig Iron.—The market continues strong, but not quite as active as during the preceding two weeks. Sales have been fairly large, however, in lots ranging from 100 to 1000 tons, principally in foundry grades, with inquiries received aggregating 15,000 to 20,000 tons for the week for deliveries over the balance of the year and running into the first half of next. Furnaces are very firm in their prices, but with no quotable advance since last week. The Buffalo Union Furnace Company is making preparations to equip its furnaces with pig casting machines, and upon completion will produce basic iron in addition to the usual makes of foundry and malleable. We quote as follows for fourth and first quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$16.00 to $16.75
No. 2 X foundry	15.75 to 16.50
No. 2 plain	15.25 to 15.75
No. 3 foundry	15.00 to 15.25
Gray forge	14.75 to 15.00
Malleable Bessemer	15.50 to 16.00
Basic	16.50 to 16.75
Charcoal	19.50 to 20.00

Old Material.—The market is growing more active, with an increasing inquiry from consumers, and prices are advancing in most lines. Sales have been almost entirely in small lots, but the aggregate has been quite heavy. As a rule dealers are holding the bulk of their stocks for the higher prices which they expect will be obtainable later. We quote dealers' prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$16.00 to $16.50
Low phosphorus steel	19.50 to 20.00
No. 1 railroad wrought	16.00 to 16.50
No. 1 railroad and machinery cast scrap	15.00 to 15.25
Old steel axles	19.00 to 19.50
Old iron axles	21.75 to 22.25
Old car wheels	15.50 to 16.00
Railroad malleable	14.75 to 15.25
Boiler plate	14.00 to 14.50
Locomotive grate bars	12.50 to 13.00
Pipe	12.50 to 13.00
Wrought iron and steel turnings	10.00 to 10.50
Clean cast iron borings	8.50 to 9.00
No. 1 busheling scrap	13.50 to 14.00
No. 2 busheling scrap	11.50 to 12.00

Finished Iron and Steel.—The market continues strong and active in all lines. The large volume of business indicated in last week's report for the month of August has been verified, all mills and agencies showing large aggregates on their order books for the month. Specifications on contracts are heavy, and the volume of new business is apparently only restricted by the inability of the mills to make specified deliveries. A good many orders, even at maximum and premium prices, are being turned down on this account, and in some instances consumers find great difficulty in obtaining material by the time required. The demand for railroad material of all kinds is increasing, and a number of inquiries for light rails for industrial and mining purposes and rails for electric lines have been received during the week. Business in sheets, black and galvanized, has also been heavy, and prices are advancing. Local fabricators of structural material are extremely busy, and the demand in this line continues active. The Buffalo Structural Steel Company was low bidder for the Casey Grand Hotel, Scranton,

Pa., about 700 tons; the steel to be furnished by the Lackawanna Steel Company. Steel for the Lackawanna Bridge Company's new works, at Buffalo, 600 to 700 tons, will also be furnished by the Lackawanna Steel Company. Contract for the fabrication and erection of the steel for the Phœnix Brewing Company's addition, Buffalo, 100 tons, went to the Buffalo Structural Steel Company. Bids will be received this week for the structural steel for the convent and mother house for the Sisters of Mercy, Buffalo, about 200 tons.

Philadelphia.

PHILADELPHIA, PA., August 31, 1909.

There is no abatement in the buying movement. Both crude and finished materials are being taken quite freely, and prices are higher practically all along the line. In crude materials, particularly pig iron, transactions for early 1910 supplies are now pronounced, for which delivery, however, some sellers have not yet opened their order books. The market is decidedly strong in every department, and materials for prompt shipment are comparatively scarce. Delays in delivery are becoming more frequent, and buyers are more anxious to cover for future needs, but sellers show little tendency to contract, and in some cases even turn down business unless specifications accompany orders. Production for August will in a number of instances break all previous records. Practically all of the finished material mills are operating at full capacity, while a number of pig iron makers are preparing idle stacks for blowing in as fast as they possibly can. The general industrial situation improves steadily. Locomotive builders, shipyards and machine tool builders note a continual betterment, and a most optimistic view of the situation is taken by the trade.

Pig Iron.—Buying continues active. Both basic and foundry irons have been taken freely and higher prices for practically all grades are to be noted. Cheap iron has about disappeared from the market and sellers who have heretofore been willing to take rather low figures, compared with what others obtained, have booked about all the orders they want at the lower level and now quote considerably higher prices. The scarcity of iron for prompt shipment has forced prices steadily upward and the higher levels have been obtained without difficulty. A number of foundry iron producers have opened their books for a limited amount of business for first quarter delivery at prices ranging from 50c. to $1 a ton over those at which business for this year is taken. Basic iron transactions continue the leading feature of the market. For prompt delivery this grade of iron is scarce. Some 6000 to 8000 tons, in scattered lots, have been bought at $17.50, $17.75 and $18, delivered, several moderate lots of Southern and Western basic being taken at the high level. Prices are now firm at $18, delivered, for this year's shipment, but very little iron is available in this territory. There is a pretty general inquiry for basic for early 1910 delivery, and several buyers have taken additional quantities at $18, delivered, for shipment during the first half of the year; the aggregate sold during the week being close to 30,000 tons. There has been a more pronounced movement in foundry iron; orders for delivery during the balance of the year have not been heavy individually, but the aggregate is large. Prices are on a more uniform basis, and standard brands of eastern Pennsylvania No. 2 X foundry are now practically all on a basis of $17, furnace, for delivery over the balance of the year. Sales of moderate lots have been pretty freely made on this basis, which is equal to $17.75 to $18, delivered, with makers showing no particular desire to sell. For delivery during the first quarter of 1910 some fair business has been done, but all makers are not yet willing to accept such business except at materially higher prices. Sales of moderate lots of No. 2 X are reported at $18.35, delivered, for first quarter, while in a few cases as high as $19 has been obtained; a number of makers hold the latter figure as the minimum for such delivery, but have not yet sold any iron. There is an active demand for low grade foundry irons from the cast iron pipe interests, and a sale of several thousand tons is reported at something over $17, delivered. These grades, however, are still extremely scarce. Southern foundry irons are practically out of the market at present prices. Virginia foundry irons are being sold in small lots at prices ranging from $17.50, for prompt, to $18 for delivery during the balance of the year, but as the majority of furnaces are sold up, as far as prompt iron is concerned, very little is available at the inside figure. Forge iron is in somewhat better demand, but no heavy business is reported; sales of small lots at $16.50, delivered, are reported, with some sellers holding 25c. to 50c. above that price. Low phosphorus iron has been more active; there have been a number of small and moderate sized transactions at $20.50, delivered in this vicinity. The tone of the market is strong; consumption appears to increase steadily, and in a number of cases producers are unable to meet consumers' wants regarding deliveries. Some idle furnaces will be blown in at an early date, but as makers are so well sold up the increased capacity will not help the situation much as far as prompt iron is concerned. Prices are distinctly higher and are being firmly held, the following range being named for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points, for the balance of the year:

Eastern Pennsylvania, No. 2 X foundry	$17.75 to $18.00
Eastern Pennsylvania, No. 2 plain	17.25 to 17.50
Virginia, No. 2 X foundry	17.50 to 18.00
Virginia, No. 2 plain	17.25 to 17.75
Gray forge	16.50 to 16.75
Basic	18.00
Low phosphorus	20.50 to 21.00

Ferromanganese.—There has been more inquiry and quite a few sales, both for Western shipment and for local delivery, have been made. Prices are somewhat less irregular, although sellers' quotations continue to show considerable variation. Ferro for this year's delivery is offered at prices ranging from $41.50 to $42, Baltimore, while for shipment the first half of next year, $42 to $44, Baltimore, is named.

Billets.—Quite a fair volume of business has been transacted, although individual sales are not heavy. Eastern mills, however, are more particular about the class of business taken. Prices show an upward movement, ordinary rolling steel for prompt shipment being quoted at $27, mill, equal to $27.50, delivered, with an advance of $1 to $2 a ton for extended deliveries. Forging billets are a shade higher, $29 to $30, Eastern mill, being quoted for prompt ordinary forging steel, the usual extras applying for high carbons and special sizes.

Plates.—There has been an increased volume of business, and in one instance at least the production for the month of August will exceed all former records. Orders placed are larger individually, and some thousand ton lots have been booked. Boiler, tank and bridge plates are in the best demand. Several sellers have again marked up prices, naming 1.60c. as the minimum for carload lots for early delivery; this figure can, however, be slightly shaded for desirable business, which is taken for early delivery only, specification with the order.

Structural Material.—Large tonnages under consideration seem slow in closing; mills, however, are taking a very satisfactory volume of bridge material and miscellaneous work and are for the most part fully engaged. Deliveries on certain classes of material are considerably delayed. Prices of plain material have been advanced by a number of mills to 1.60c., minimum, for delivery in this territory, although the range is still 1.55c. to 1.65c., delivered, dependent on tonnage and specification.

Sheets.—The market is in a very healthy condition; a good demand for prompt deliveries continues to come out and local mills are fully engaged. Order books are in better shape than they have been for some time, even though but little business for extended delivery is being taken. The following prices are named for prompt shipment, an advance of about $2 a ton, dependent on conditions, being asked for extended delivery: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—The market shows increasing strength. There is a better demand, and prices show an upward movement. Mills, for the most part, will not sell for extended deliveries, and the bulk of the business transacted is for comparatively early shipment. Steel bars are active, and deliveries in some cases are delayed. Several mills have advanced the price of steel bars to 1.55c., delivered, but 1.50c. can still be done. Refined iron bars are higher at 1.50c. to 1.55c., delivered.

Coke.—There is considerable inquiry for furnace coke for early 1910 delivery, for which such producers as are willing to quote, name higher figures. Furnace coke for the balance of this year commands from $1.75 to $1.90 per net ton, at oven, for forward delivery, $2 to $2.15, at oven, has been named. Foundry coke is not very active, with early deliveries quoted at $2.15 to $2.25, at oven. The following range of prices is named for early delivery in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.40 to 4.50
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.00 to 4.10

Old Material.—The situation regarding heavy melting steel is practically unchanged. The associated mills claim to be obtaining sufficient supplies at $17, delivered, but unassociated mills are paying higher prices and the outside dealers refuse to sell steel at the $17 level, preferring to hold their material, believing that a higher level will be reached before long. Steel scrap is scarce and the tonnage that could be picked up at the above price appears to be limited, and it is doubtful if any quantity could be bought out except at a material advance. The various other grades of old material used by the steel mills show increased strength. Rolling mill scrap is higher on moderate transactions. Some movement in low phosphorus scrap is noted, sales of some 3000 tons for early delivery being reported at $20.50, delivered in this territory. A lot of 500 tons was sold by an Eastern mill at $20, mill. Quotations, owing to existing circum-

stances, are nominal to a certain extent, but range about as follows for deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$17.25 to $17.50
Low phosphorus	20.50 to 21.00
Old steel axles	22.00 to 23.00
Old iron axles	24.50 to 25.50
Old iron rails	20.00 to 21.00
Old car wheels	16.50 to 17.00
Choice No. 1 R. R. wrought	19.75 to 20.25
Machinery cast	15.50 to 16.00
Railroad malleable	15.00 to 16.00
Wrought iron pipe	17.00 to 17.50
No. 1 forge fire scrap	15.00 to 15.50
No. 2 light iron	10.00 to 10.50
Wrought turnings	14.25 to 14.75
Stove plate	13.00 to 14.00
Cast borings	12.25 to 12.75
Grate bars	14.25 to 14.75

Cleveland.

CLEVELAND, OHIO, August 31, 1909.

Iron Ore.—The market continues fairly active. A few sales of lots ranging from 25,000 to 35,000 tons are reported, in addition to a number of smaller sales. Some of the largest ore firms have sold practically all their best ores. Late buyers will have to take what they can get, and it is expected that a considerable quantity of low grade ore will be sold before the season's buying is over. Shipments down the lakes continue large and everything points to a heavy movement the balance of the season. Owing to the fact that there was a large stock on the docks at the opening of navigation, very little space is there available, and this is delaying the unloading of boats, now that many consumers are asking that their ore be placed on the dock piles. It is expected that some ore that buyers wished to have left on the docks will have to be sent forward directly to the furnace yards. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market is quite active on all grades. A buying movement in foundry iron for the first half delivery has been in progress all the week and a fairly large aggregate has been sold in lots ranging from 200 to 1000 tons. The sales were made at $16.50, Cleveland and Valley furnaces, for No. 2, which at present seems to be the generally established price for delivery after the first of the year. Buying has been quite general in this district, and some good sized sales and inquiries are reported from adjoining districts, inquiries running to as high as 5000 tons. There seems to be a disposition among the stovemakers and other large consumers to cover for their first half requirements. Prices are very firm and local furnaces have made another advance in prices. One is now quoting $17, at furnace, as its minimum price for No. 2 for delivery after January 1, and another is asking the same price for any delivery. For the balance of the year Valley furnaces are holding to $15.50 to $16 for No. 2. There is very little inquiry for spot and last quarter iron. The demand for malleable iron has become quite active and some of the large consumers are in the market with inquiries for delivery during the first half. Two additional merchant furnaces controlled by local interests will shortly be placed in blast. Fannie Furnace of the United Iron & Steel Company, West Middlesex, Pa., now operated by M. A. Hanna & Co., will be blown in this week on Bessemer iron. Pickands, Mather & Co., expect to blow in their B Furnace in Toledo, which is now being relined, about September 10. When this furnace went out early in August their A Furnace in Toledo was started up, and when B blows in both will be kept in operation. For the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	$17.65
Northern foundry, No. 1	$17.00 to 17.50
Northern foundry, No. 2	16.50 to 17.00
Northern foundry, No. 3	16.00 to 16.50
Southern foundry, No. 2	17.85
Gray forge	15.50 to 15.75
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—Prices have advanced rapidly the past few days. Furnace coke for spot shipment is held at $2.25 to $2.50 per net ton, at oven, and the available supply is said to be very scarce. Standard makes of 72-hr. foundry coke are now held at $2.40 for the balance of the year and $2.65 to $2.75 for the first half of next year.

Finished Iron and Steel.—One or two mill agencies report a slight falling off in specifications, owing to the fact that consumers have been anticipating their requirements for some time ahead. The majority of the mill agencies, however, report as heavy specifications as ever and no improvement in any deliveries. The most important prospective tonnage that has come out during the week is for three lake boats that will be built for the Northern Lakes Steamship Company, a new Cleveland concern. A contract for these boats has been placed with the Great Lakes Engineering Works, Detroit. The boats will each be 564 ft. long and will have a carrying capacity of 8300 tons. They will be built in time for the opening of navigation next season and will require in their construction about 8000 tons of plate and shapes. The outlook for the lake trade next year is very bright and this is expected to have a stimulating effect on the shipbuilding industry during the next few months. The American Shipbuilding Company is now figuring on inquiries for a number of freight boats, for which orders will probably be placed within a few weeks. Not a great deal of new business is coming out, but a number of consumers of steel bars, plates and sheets who are not covered for the balance of the year are anxious to make contracts for the last quarter. Some bar consumers wish to place orders for delivery after the first of the year, and it is reported that a few contracts have been closed for delivery until April 1. Some new plate contracts have been closed for delivery until January 1 at 1.45c., Pittsburgh, and one local mill has advanced its price to that basis for any delivery before the end of the year. For prompt shipment, mills are getting orders for small lots of plates and structural material at $2 a ton premium. The demand for sheets continues heavy and prices are firm. Deliveries are not generally promised on galvanized and cold rolled sheets within four to six weeks, and on galvanized sheets within six to eight weeks. The demand for iron bars continues fairly good and prices are firm. We quote iron bars at 1.40c. to 1.50c., Cleveland. Warehouse orders received by jobbers continue heavy.

Old Material.—The market is fairly active, although buying is altogether in small lots. A large part of the trading during the week has been between dealers. The market is firm, and an advance is noted in the price of several grades. Heavy melting steel has dropped off about 25c., owing to the fact that one large local consumer has not been buying. Dealers generally are demanding about 50c. a ton more than consumers are willing to pay. Owing to the advance in the price of pig iron the demand for cast scrap has improved, foundries buying more than they have for several months. Railroad lists are out from the Pennsylvania lines, West, to be closed September 2, and the Erie to be closed September 3. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$16.00 to $16.50
Old iron rails	17.50 to 18.00
Steel car axles	19.00 to 19.50
Old car wheels	16.00 to 16.50
Heavy machine steel	15.00 to 15.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$19.50 to $20.00
Cast borings	7.50 to 8.00
Iron and steel turnings and drillings	9.50 to 10.00
Steel axle turnings	11.00 to 11.50
No. 1 busheling	13.00 to 13.50
No. 1 railroad wrought	14.50 to 15.00
No. 1 cast	13.50 to 14.00
Stove plate	11.50 to 12.00
Bundled tin scrap	10.00 to 10.50

Birmingham.

BIRMINGHAM, ALA., August 30, 1909.

Pig Iron.—The market is strong and active, inquiries continuing to come in freely. The pressure brought to bear on producers by customers whose demands could not well be denied has evidently brushed aside the barrier, and certain interests are taking on some business for the first quarter of 1910. The price, however, is $14, f.o.b. cars at the furnace, on the basis of No. 2 foundry. During the past week a few thousand tons were sold for the balance of this year on the basis of $13.50, at furnace, and for prompt shipment or for the balance of 1909, $13.50 prevails. Inquiries and demands of the light casting manufacturers, as well as the foundry trade in general, are being received and met, and every indication along those lines points to a healthy condition of the market. The railroads are doing considerable repair work on their equipment and otherwise, preparatory to being able to handle successfully and expeditiously the crops of the country. The charcoal iron market continues to hold its own, with a fair share of business offering. Prices remain at $20.50 to $21, f.o.b. cars, at furnace.

Old Material.—Dealers report that while trading has been mostly in small lots here and there, they are still ardently on the lookout for all the scrap they can find within reasonable limits. We quote dealers' asking prices as follows:

Old iron rails	$15.00 to $15.50
Old iron axles	15.50 to 16.00
Old steel axles	12.50 to 13.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 country wrought	10.00 to 10.50
No. 2 country wrought	9.50 to 10.00
No. 1 machinery	11.50 to 12.00
Tram car wheels	11.00 to 11.50
Standard car wheels	12.50 to 13.00
Light cast and stove plate	10.50 to 11.00
No. 1 steel	11.00 to 11.50
Cast borings	5.50 to 6.00

Cast Iron Pipe.—The prevailing quotations for some

weeks have not been altered, though inquiries are reported very brisk, with comparatively good trading in small lots. It is understood that some heavy business is soon to come up. Taking into consideration the fact that the iron producers have opened their books for the early part of next year, it is not at all improbable that substantial pipe business will be taken on. Water pipe is quoted as follows, per net ton, f.o.b. cars here: 4 to 6 in., $26; 8 to 12 in., $25; over 12 in., average $24, with $1 per ton extra for gas pipe.

New York.

NEW YORK, September 1, 1909.

Pig Iron.—The feature of the week is the fact that prices for spot and prompt foundry iron have advanced to the figures at which iron for next year's delivery has been held, and that quite a business has been done at these prices. The minimum for prompt delivery is now the basis of $17, at Eastern furnace, for No. 2 foundry. Among the buyers, for forward delivery, have been a leading electrical concern, which has taken round lots, a Connecticut jobbing foundry, which has purchased close to 6000 tons, and some textile machinery builders who have purchased about 2000 tons each. We quote Northern No. 1 foundry, $18.25 to $18.50; No. 2 foundry, $17.75 to $18, and No. 2 plain, $17.25 to $17.50, tidewater. Alabama iron is quoted on the basis of $17.75 to $18 for No. 2 foundry, New York.

Ferroalloys.—Large sales of ferromanganese continue to be made, and sellers are getting from $43 to $44, delivered in New York. Ferrosilicon is fairly plentiful; while the market price is $63, one manufacturing company is said to have offered it for something under that price.

Steel Rails.—A number of roads are figuring on rails for next year, particularly Western lines. There has been a disposition in some quarters to treat the enlarged rail requirements expected for 1910 as though already on the books; but there is not the same interest shown by Eastern roads in securing early bookings as is the case with certain Western lines. The latter must pay more in frieghts for any rails they require over and above what can be rolled in the Chicago District, and naturally will engage deliveries from the Gary or South Chicago mill for all their needs where this is possible. In the past week the reorganized Chicago & Great Western Railroad Company ordered 12,000 tons for this year, all open hearth rails, and the B. & O. 3000 tons. The New Haven is taking up the matter of its requirements for next year, but no orders have been given. The New York Central contract is expected to include a considerable percentage of ferrotitanium rails. A large order for frogs and switches, placed with the Pennsylvania Steel Company, has been announced in the past week.

Structural Material.—The August business of the American Bridge Company amounted to about 50,000 tons, or 40 to 45 per cent. of the total. The large contract for the New York, West Chester & Boston Road was the most important in the month. New business in general is scarcely replacing that turned out by the fabricating shops, though a number of good sized jobs are ahead. The West, particularly the Chicago District, has shown most activity in structural work recently, and the railroads in that section have plans for next year, of which more will be heard later. In New York City several steel building projects are being figured on, including the Johnson Apartment Building, at 113th street and Broadway, 1300 tons. The Jones & Laughlin Steel Company has the contract for the Rockfall Realty Company's Building, at Fifty-fourth street and Seventh avenue, 500 to 600 tons, and the American Bridge Company has taken a William Street building, 1300 tons. The Reciprocity mill at Boston is again being figured on and about 1000 tons of steel will be required. The Cambria Steel Company will furnish 900 tons of steel for Pennsylvania Railroad bridge work at Johnstown, Pa., and the Bethlehem Steel Company, 400 tons, for the Boston Elevated. The mills are making good shipments, but in some cases work is held back by delay in getting out material. We quote 1.56c., New York, for beams and channels shipped from mill, and some mills are now quoting 1.61c. Material cut to length is sold from stock at 1.80c. to 1.90c.

Bars.—Bar iron is in considerably stronger demand. Most Eastern bar iron manufacturers are more confident of the future, and are disinclined to quote on inquiries, except for immediate specifications. Ordinary bar iron is firming up to 1.55c., tidewater, while leading manufacturers are quoting refined and test bars at 1.60c. to 1.65c., tidewater. Steel bars are quoted at 1.51c. to 1.56c., tidewater.

Wrought Iron Pipe.—Eastern manufacturers report specifications crowding in on them, and all are 30 days behind in making deliveries on contracts. Another advance in price is expected before September 15; in fact, most of the mills are receiving premiums for prompt shipment.

Cast Iron Pipe.—The demand for small quantities is excellent and will continue until cold weather sets in. The sustained strength of pig iron and the expectation that it will have a marked effect on cast iron pipe prices are causing important pipe consumers to consider seriously the question of anticipating their requirements for next spring. As indicating the progress of this sentiment, the fact may be mentioned that a large consumer in the Central West is considering the placing of an order for 22,000 tons. It will depend, of course, on the prices which an inquiry of this kind will bring out. Quotations have advanced and it is probable that $24.50 per net ton, tidewater, is now the lowest price at which carload lots of 6-in. can be purchased.

Old Material.—The Eastern rolling mills are buying considerable stock, as all of them are getting quite busy, and only a few have any considerable quantities of scrap on hand. Heavy melting steel scrap is in sharp demand, with inquiries for fairly large quantities from various directions, but most holders are unwilling to dispose of this material, except in the case of such lots as must be moved. Low phosphorus steel scrap is being vigorously sought for. Heavy cast scrap and wrought pipe are in excellent demand. Among the strongest items in the market are old car wheels, and all grades of foundry scrap. Malleable cast is exceedingly scarce, especially in New England. Quotations are as follows, per gross ton, for delivery in New York and vicinity:

Rerolling rails	$16.00 to $16.50
Old girder and T rails for melting	15.00 to 15.50
Relaying rails	23.00 to 24.00
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	19.50 to 20.00
No. 1 railroad wrought	17.00 to 17.50
Iron track scrap	15.00 to 15.50
No. 1 yard wrought, long	15.00 to 15.50
No. 1 yard wrought, short	14.00 to 14.50
Light iron	9.50 to 10.00
Cast borings	9.50 to 10.00
Wrought turnings	11.00 to 11.50
Wrought pipe	13.50 to 14.00
Old car wheels	15.50 to 16.00
No. 1 heavy cast, broken up	14.50 to 15.00
Stove plate	12.50 to 13.00
Locomotive grate bars	12.50 to 13.00
Malleable cast	15.50 to 16.00

Iron and Industrial Stocks.

NEW YORK, September 1, 1909.

The stock market has been dominated by the varying news regarding the health of E. H. Harriman. When disturbing reports were circulated as to his condition, the market weakened seriously and quite low prices were made on Thursday and Friday. Under reassuring statements an improvement in speculative sentiment occurred and an advancing tendency was then shown, which continued into the present week. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	15 - 15⅞	Railway Spr., com.	48 - 50
Allis-Chalm., pref..	52½- 54⅝	Railway Spr., pref.	107 -107½
Beth. Steel, com...	31½- 33	Republic, com.....	36 - 38¼
Beth. Steel, pref...	63½- 65	Republic, pref.....	104 -105¼
Can, com.....	12⅛- 12¾	South. I. & S., pref.	54¼- 55¾
Can, pref.....	82¼- 83¾	Sloss, com.....	83 - 85
Car & Fdry, com..	64¾- 68¾	Pipe, com.....	31½- 32½
Steel Foundries...	57 - 59¾	Pipe, pref.....	84 - 85
Colorado Fuel.....	42½- 45⅛	U. S. Steel, com..	73¾- 78¼
General Electric...	165 -169½	U. S. Steel, pref...	123½-125⅞
Gr. N. ore cert....	78½- 82⅝	Westinghouse Elec.	84¼- 87
Int. Harv., com.....	88	Chi. Pneu. Tool...	30½- 32
Int. Harv., pref...	120½-120⅞	Am. Ship, com.....	65
Int. Pump, com...	42 - 45⅝	Am. Ship, pref.....	110
Int. Pump, pref...	88½- 89¼	Cambria Steel.....	43 - 44⅝
Locomotive, com...	57¼- 62	Lake Sup. Corp...	27¼- 28¾
Locomotive, pref..	115½-116¼	Penn. Steel, pref..	116 -116½
Nat. En. & St.,com.	16½- 19¼	Warwick	9⅛
Nat. En. & St.,pref.	93⅛- 96	Crucible St., com..	13¼- 14
Pressed St., com...	48 - 50⅜	Crucible St., pref..	79⅛- 81
Pressed St., pref..	102¾-105	Harb.-W. Ref., com.....	31

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 77, preferred 125½, bonds 107⅛; Car & Foundry common 67¾, preferred 120; Locomotive common 60¼, preferred 116; Steel Foundries 59; Colorado Fuel 44¼; Pressed Steel common 49¾, preferred 103¼; Railway Spring common 49⅝; Republic common 38, preferred 105¾; Sloss-Sheffield common 84⅝; Cast Iron Pipe common 32½, preferred 84; Can common 12½, preferred 83¼.

In connection with recent offers of the Penn-Mary Coal Company's bonds by bankers who took the $2,000,000 issue of April 1, 1909, the statement of President Felton of the Pennsylvania Steel Company is quoted to the effect that the lands of the company, all the stock of which is owned by the Pennsylvania Steel Company, are in excess of 16,000 acres in Indiana and Cambria countries, Pennsylvania. Of two workable seams one contains 60,000,000 tons and the other 40,000,000 tons of coal. The plant includes a model miners' village of 221 houses; electric power plant and two coal tipples, one of steel construction throughout. The property cost in excess of $2,500,000 and has been shipping at the rate of 70,000 tons a month. This will be increased until the entire requirements of our steel companies are met. The Pennsylvania and Maryland steel companies have contracted to purchase the output at a price which will enable the coal company to meet its interest and sinking fund requirements. The price fixed by this contract is now

yielding the coal company yearly profits of about $70,000 in excess of these requirements.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall Street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926	88	89
Bethlehem Steel purchase money 6s, August, 1998	117	..
Buffalo Iron 5s, October, 1925	..	100
Buffalo & Susquehanna Iron 1st 5s, June, 1932	99¾	..
Buffalo & Susquehanna Iron deb. 5s, January, 1926	94	..
Dominion Iron & Steel 5s, July, 1929	97	98
La Belle Iron 1st 6s, December, 1923	104½	..
Lackawanna Steel 1st 5s, April, 1923	98⅝	98⅝
Maryland Steel 1st 5s, February, 1922	102	..
Pennsylvania Steel 1st 5s, November, 1917	102	..
Pennsylvania & Maryland Steel 6s, September, 1925	..	110½
Republic Iron & Steel 1st 5s, October, 1934	101¼	101¾
Sloss Iron & Steel 1st 6s, February, 1920	106	..
Sloss Iron & Steel consol. 4½s, April, 1918	95	..
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951	114¾	115½
Collateral Trust 5s, Series B, D, F, April, 1951	114¾	115½
Sinking Fund 5s, April, 1963	107	107⅛
Union Steel 1st 5s, December, 1952	105	106
Clairton Steel 5s, 1908-1913	101	..
St. Clair Furnace 1st 5s, 1910-1939	101	..
St. Clair Steel 1st 5s, 1908-1926	101	..
Illinois Steel deb. 5s, January, 1910	100⅛	..
Illinois Steel 5s, April, 1913	100¼	..

All bonds quoted "and interest."

It is stated that of the $500,000 bonds of the Ralston Steel Car Company, Columbus, Ohio, to secure which a mortgage has been filed to the Columbus Savings & Trust Company, a part will be used to retire $240,000 of Rarig Engineering Company bonds. The car company's plant was acquired from the above company. The proceeds of the remaining bonds, which are reported to have been sold in London, will be applied to improvements, extensions and to working capital.

New preferred stock of the Colonial Steel Company, Pittsburgh, to the amount of $750,000, is being offered to the public through a Pittsburgh brokerage house. The additional stock is to be used by the company in making large improvements to its plant.

Dividends.—The American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 21.

The International Silver Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 1.

Metal Market.

NEW YORK, September 1, 1909.

Copper.—The copper situation is decidedly quiet. With the exception of a few small transactions, nothing has developed in the trade during the week. The principal topic of discussion is the falling off in the exports of copper in the month of August. It will be remembered that in July 35,000 tons of copper was sent abroad, while the exports last month amounted to 22,839 tons. It was thought that the curtailment might influence the London market and send prices up to some extent, but this has not as yet occurred. At present electrolytic copper can be had for 13.25c., delivered in the Naugatuck Valley in 30 days, and lake copper is bringing 13.50c. There have been few changes in the London market, and to-day it was quoted at £59 2s. 6d. for spot, and £60 1s. 6d. for futures. The market was easy.

Pig Tin.—The demand for pig tin has fallen off to some extent. While conditions looked very rosy early in the week, the market broke sharply in the last 24 hr. A good deal of tin has been taken by consumers, and it is generally admitted that the high prices established during the week were warranted. They were as follows:

	Cents.
August 25	30.25
August 26	30.50
August 27	30.50
August 30	30.80
August 31	30.65
September 1	30.25

The monthly statistics for August, compiled by C. Mayer of the New York Metal Exchange, show that deliveries into consumption that month were large, amounting to 3300 tons. The total for eight months shows an increase of 5050 tons, compared with the same time last year. The combined deliveries of London and Holland for August were 274 tons smaller than last year. For the month the decrease in deliveries amounts to 586 tons, compared with the same time last year. Shipments from the Straits for August were 1287 tons smaller than for the same month of last year. For the eight months of this year the decrease in shipments amounts to 2509 tons, compared with the same time last year. Australia shipped 125 tons smaller in August compared with the same month of last year. For the eight months of this year the shipments were 405 tons smaller compared with the same time last year. The total visible supply on August 31, 1909, was 1925 tons above that of August 31, 1908. In London to-day the market was somewhat weaker than yesterday, when a price of £140 was established, which was the high price of the year, but the tone changed to-day and the market closed with tin at £137 7s. 6d. for spot and £138 7s. 6d. for futures. The sales were 400 tons of spot and 420 of futures, and the market closed weak.

Lead.—There is some uncertainty as to the price of lead. While reports of low prices in New York are not very definite, it is evident that the market is not firm, and in St. Louis some low sales have been quoted. On the Metal Exchange floor 100 tons of September lead was sold Monday for 4.37½c., and it is declared that the lead changed hands. The American Smelting & Refining Company is asking 4.40c., and some outside interests are asking as high as 4.45c. In St. Louis a sale has been reported at 4.25c., but the usual quotation is 4.30c. The London market is not very firm, and the prevailing price is £12 11s. 3d.

Tin Plates.—It is apparent that a number of independent mills are getting a premium of 15c. a box for tin plates, but the American Sheet & Tin Plate Company has not raised its price as yet. It is generally admitted, even by the manufacturers, that tin plates are scarce, and unless there is an increased production shortly it is felt that the price will have to go up. Quotations at present for 100-lb. IC coke plates are $3.64 per box, but it is not easy to obtain them for early delivery.

Spelter.—While there is no great demand for spelter, the market is firm, and the higher prices mentioned last week are being well maintained. Sellers are asking 5.85c., New York, and 5.70c., delivered in St. Louis.

Antimony.—Plenty of antimony is on hand, but there is no great demand for the metal. Cookson's can be obtained for 8.50c., Hallett's for 8c. and other brands as low as 7.25c.

Aluminum.—Imported aluminum is still bringing a high price, but that situation has had no effect on prices for domestic aluminum, and it is declared that it will not occasion a raise in the asking price of metal manufactured in this country. At present both foreign and domestic makes of aluminum are bringing 24c. per pound.

Old Metals.—The following dealers' selling prices represent the New York market:

	Cents.
Copper, heavy cut and crucible	12.75 to 13.00
Copper, heavy and wire	12.25 to 12.50
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.25 to 9.50
Brass, light	7.25 to 7.50
Heavy machine composition	11.75 to 12.25
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 9.75
Lead, heavy	4.20 to 4.25
Lead, tea	3.90 to 3.95
Zinc scrap	4.15 to 4.25

An American Permanent Sample Exhibition at Berlin.—Arrangements have been perfected for opening up a permanent American sample exhibition at Berlin in the spring of 1910. It is designed primarily as an exhibit of distinctively American products, and the management is especially desirous that manufacturers of novelties shall take part. The intention is to make apparent to the people of Europe, and especially Germany and the Continent, the importance and excellence of American manufactures, and to this end the German committee will advertise the exposition throughout the Continent, and will co-operate with American manufacturers and exporters in every way to popularize and exploit American products. The headquarters of the American committee is at 77 and 79 Broad street, New York City. Blank applications for space and all information in regard to the exposition may be obtained by addressing the American Exhibition Company at that address.

A New Pig Iron Production Record.—The blast furnaces of the United States Steel Corporation made a new record in August at approximately 1,100,000 gross tons, including ferromanganese and spiegeleisen. The July output, which was a record up to that time, was 1,008,000 tons.

The Keystone Driller Company, Beaver Falls, Pa., is completing a shipment of eight drilling machines to Russia, to be used by the Lena Gold Mining Company, St. Petersburg, in gold placer mining testing. The Keystone Driller Company is well supplied with orders for both foreign and domestic shipment. The foundry and pump departments are behind with orders and the capacity of the forging department is being increased. A brick building is being erected to take the place of the carpenter shop destroyed by fire recently. Electrically driven machinery is being installed.

The Tennessee Coal, Iron & Railroad Company has placed an order for a new large plate mill engine for its rolling mill at Bessemer, Ala.

The Machinery Trade.

NEW YORK, September 1, 1909.

Machinery houses report a better demand for tools the past week, when inquiries were considerably more numerous in comparison with the earlier weeks of the month. Aside from one fair sized list of tools which has been sent out for bids, the inquiries were practically all for small lots. These came from many sources, though the automobile industry figures prominently among the prospective buyers, and indicate that business in all branches using metal working machinery is gradually expanding. Orders were also more plentiful and some fair sized business has been placed, though the formal orders have not yet been signed. Practically none of this business came from the railroads, which, despite their increased earnings and expenditures for rolling stock, are spending very little for mechanical equipment. Some concern is felt over the very few sizable projects before the trade for the carrying out of which large amounts of mechanical equipment will be required at an early date. Unless the railroads shall come into the market for extensive requirements, it would seem that for some time to come business will maintain the same character as at present, with a gradual increase in volume. Few houses report as large a volume of business the past month as July. It was not thought that the sales of August would equal those for July, in view of the large purchases made in the latter month; but those who did not share in the large business report fewer orders in August, notwithstanding the betterment of the past week.

American Locomotive Company's Improvements.

The large amount of buying in the way of machine tools and general machinery equipment which has been done of late by the American Locomotive Company does not by any means represent the extent of the purchases for the improvements planned, and it is evident that money will be spent by the company with the machinery trade on a large scale for some time to come. A formal announcement was made on August 25 by the directors of the corporation to the effect that an issue of $5,000,000 of 5 per cent. debenture notes was planned to reimburse the company's treasury for improvements, and these notes also provide for additional working capital. In that connection the following statement from the president of the company, which was ratified by the Board of Directors, is significant to the machinery trade: "In order to take advantage of the prevailing low prices of materials and facility and economy in making improvements when the plants were not in full operation, the directors, with full belief in the future prosperity of the country, some time ago authorized extensive improvements in the large works of the company at Schenectady and Dunkirk, N. Y., Pittsburgh, Pa., and Richmond, Va. Plans have been prepared and contracts let for these improvements, which it is expected will result in a largely increased capacity and reduction in manufacturing costs. The improvements entail an expenditure of $3,500,000, for which it will ultimately be necessary to reimburse the treasury of the company. Accordingly the directors have authorized an issue of $5,000,000 5 per cent. gold debenture notes to reimburse the treasury for the amount expended in improvements and to provide additional working capital necessary to conduct the greater volume of business made possible by the increased facilities." While the contracts have been let for most of the buildings planned, there are still inquiries in the trade for much in the way of machine tools and general machinery equipment, and it is thought that it will be several months before the buying will be entirely completed. Only recently the company placed an order with a prominent machine tool builder for $150,000 worth of electric traveling cranes, which is said to be the largest order of the kind ever given in this country, and additional buying, it is expected, will be done for the Dunkirk and Schenectady plants, where buildings are now in course of erection. These include the construction of a tank shop, 185 x 823 ft., and tank paint house at the Brooks plant at Dunkirk. A machine shop is also to be erected there and this will be 185 x 600 ft. In all about $700,000 will be spent at Dunkirk, and the plans of the company are to divide the rest of the $3,500,000 appropriation between the Schenectady, Pittsburgh and Richmond plants. The Richmond plant, where some steam shovels have been manufactured, will be again used almost entirely for the construction of locomotives and, perhaps, tanks, while the Rogers plant at Paterson, N. J., will be utilized for the manufacture of most of the contractors' equipment turned out by the company. The machine tool trade has already had a large amount of business from this source, and the buying of the company has gone a great way toward imparting to the general machinery trade a healthy tone for some time past.

The Nelson Valve Company, Chestnut Hill, Philadelphia, Pa., is making fast progress in the construction of its new plant, and it is thought the company will come into the market shortly for considerable new mechanical equipment. This plant is to consist of 10 buildings of reinforced concrete construction, including a brass foundry, 48 x 260 ft., brass machine shop, 48 x 256 ft.; iron machine shop, 48 x 176 ft.; storage and office building, 48 x 216 ft.; assembling room, 64 x 90 ft.; pattern shop, 48 x 48 ft.; pattern storage vault, 48 x 80 ft.; addition to the iron foundry, 50 x 64 ft.; chemical and testing laboratory, 32 x 35 ft., and a boiler house which has been equipped with Babcock & Wilcox boilers.

Machinery is being purchased by the American Car & Foundry Company, St. Louis, Mo., for its plant at Berwick, Pa. The company has lately made a number of improvements to its various plants which will necessitate the installation of considerable new machinery. At its Jackson & Sharp plant, at Wilmington, Del., a modern car erecting shop and a steel underframe shop are to be built. The former building will be located on the site of the old lumber yard and will be 160 x 450 ft. The underframe shop will be 110 x 300 ft. and will be equipped for steel work entirely. It is the intention to have these buildings ready for operation at as early a date as is possible.

There are some inquiries in the trade for extensive machinery requirements to be installed on a sugar estate at Nipe Bay, Cuba, which is to be built by interests with which F. S. Dumois of 18 Broadway, New York, is closely connected. The plans, on which several engineering companies are figuring, call for a large sugar mill, including grinding equipment, boilers, engines, other power accessories and, in fact, the complete requirements for a large sugar estate.

The Cayuga Lake Cement Company, M. E. Calkins, manager, Ithaca, N. Y., will soon start construction on an addition increasing its present capacity of 1200 bbl. to a daily capacity of 2500 bbl. The additional equipment will include about 1000 hp. of boilers and an electric generating plant of about 400 kw. The crushing, conveying and cement making machinery is all to be motor driven. Work will be started late this fall and in time that improvements may be completed for next year's business. No orders for machinery or equipment have as yet been placed.

The Selden Motor Vehicle Company, George B. Selden, president, Rochester, N. Y., has plans out for bids covering the construction of a new plant to be erected at University avenue and Probert street for the manufacture of gasoline automobiles. The main building is to be two stories, 60 x 300 ft., with a wing, one story, 100 x 136 ft. Construction is to be of brick, steel and concrete, with a total floor space of 55,000 sq. ft. Construction work is to be started within the next 10 days.

The New York Wire & Spring Company is to abandon its plant at Hoboken, N. J., and has leased the five-story and basement building at 32 Washington street, New York, where it will install its plant. The new plant will be fitted up with modern machinery, the machines to be operated by individual motors, it being the intention to make this a most complete and up to date plant for the manufacture of springs.

The recent incorporation of several power companies in Lansing, Mich., brings forward a plan to utilize power sites in northeastern Michigan for the development of hydroelectric plants, and it is stated that at least one plant will be built in the near future by those interested. It is understood that the Saginaw Power Company of Saginaw, Bay City Power Company of Bay City, the Pontiac Power Company of Pontiac, Mich., and the Charlotte Power Company of Charlotte, N. C., are all interested in the incorporation of 14 new companies which have filed articles of incorporation. These 14 companies do not by any means mean that all of them will go into construction work and they are probably designed as holding companies to retain advantageous power sites. Hodenpyl, Walbridge & Co., 7 Wall street, New York, and the E. W. Clark Company, Philadelphia, are both said to be interested in the project as financial backers. One and perhaps two good sized power plants will be constructed by the interested concerns within a short time, and perhaps extensive operations along the same lines will follow.

The Board of Water Commissioners, Marietta, Ga., will receive bids until September 20 for all materials, machinery and construction of a system of water works for the city. The principal requirements for the system are a 1,000,000-gal. compound pumping engine, 1,500,000-gal. two-stage centrifugal pump with 100-hp. motor, 1,000,000-gal. centrifugal pump with 75-hp. motor, 150-kw. generator direct connected to Corliss or four-valve engine, with switchboard, exciter, &c.; two 66 in. by 18 ft. boilers, with heater and feed pump, cross flue and stack, brick building, 1400 tons of cast iron pipe from 4 to 14 in., one 40 x 50 ft. reinforced concrete or steel standpipe, valves, hydrants, reinforced concrete filters, reinforced concrete cleaning and coagulation basins, storage basins, &c. Plans may be secured from the city clerk or the engineers, J. B. McCrary & Co., Empire Building, Atlanta, Ga.

Catalogues Wanted.—The Wilhelm-Rivenburg Com-

pany, Coal Exchange Building, Scranton, Pa., has been incorporated, with a capital stock of $25,000, with the following officers: R. A. Blackwood, president; C. E. Oram, vice-president; H. W. Rivenburg, treasurer and manager, and J. Suttie, secretary. The company will act as manufacturers' agent, dealing in mill, railroad, factory and contractors' supplies, and will also contract for the construction and act as engineer for steam and power plants, pumping and water stations, &c. Associated with it is a corps of civil and mechanical engineers. The company desires to receive catalogues from manufacturers of such products as it handles.

New England Machinery Market.

BOSTON, MASS., August 31, 1909.

Business holds up, and the strengthening of conditions in general continues. The trade is confident that only a few weeks from now will see the beginning of the rush for machinery. Inquiries indicate that such will be the case. The labor market looms up as the most threatening feature of business, complaints of inability to secure competent workmen being heard from many sources. Some shops would now be running with night shifts if it were possible to get together sufficient men. Most works were compelled during the depression to disorganize their forces to a greater or less extent, and the process of effecting a smooth running shop system is now under way. Men were laid off and many of them tired of waiting in their home towns and sought employment in those industries which felt the depression less severely, notably with the automobile manufacturers and kindred lines. However, these matters are beginning to correct themselves as new men are broken in, and the usual readjustment of labor conditions goes on.

A striking commentary on general conditions in New England is found in the figures of F. W. Dodge & Co. showing building operations from January 1 to August 25, 1909. Contracts awarded amount to $103,535,000, as compared with $67,765,000 in 1908, an increase of more than 54 per cent., and to $90,892,000 in 1907, an increase of more than 14 per cent. The present year is a record of the decade, while 1908 is the lowest since 1904. The amount of new building follows closely the degree of business prosperity. A good year of building denotes the return of industrial confidence, with its influence upon expansion. The amount of building fell off sharply in 1908, reflecting the general slump of 1907 and the tightening of the money market. During 1908 general business was poor, but confidence was beginning to assert itself, which became strong with the opening months of the current year, as reflected in an impressive manner in the building trades. The jump was very sudden, when compared to the last revival. In 1901 the total for the corresponding period of the year was, in round numbers, 77,000,000; in 1902, the high mark previous to 1907, it was $86,000,000. The panic of 1902 brought the total for 1903 down to $74,000,000, and the decline went still farther, to $59,000,000 in 1904, which was low tide, followed by a gradual increase, to $73,000,000 in 1905, $83,000,000 in 1906, and finally to $90,000,000 in 1907. It took three years to effect an increase of 54 per cent., practically the same increase which has taken place between last year and this. It has been deduced from these figures that general business conditions are returning to better than normal much more rapidly than is usually the case after a bad slump. Many of the year's building contracts are for industrial works, chiefly textiles, the cotton industry being particularly prominent in this respect. The metal industries promise to figure more prominently during the closing months of the year in announcements of proposed construction. Machinery builders and others who use machine tools are planning either to finish buildings, the initial work upon which was done before the market went to pieces, or to carry on plans for enlargements which were made two years ago and never begun. Those who finished new buildings, including those who went on with the work even when the prospect that they would soon be needed was exceedingly dubious, are now congratulating themselves upon the possession of valuable floor space.

The leather belting business has improved in a very important way, orders coming from seemingly every branch of manufacturing industry. There has been sharp economy on the part of users of belting, who have permitted their supplies to run down to practically nothing. Idle machines have been robbed to provide belting for those in operation, until, with the return of good business, it had become necessary to buy in material quantities. The jobbers, too, have let their stocks get very low and are now replenishing them.

The Brown & Sharpe Mfg. Company, Providence, R. I., is very busy, the force of men employed approaching the maximum figure of two years ago, though not yet reaching it owing to the difficulty of securing suitable help, good men being especially scarce in Providence and vicinity.

The General Fire Extinguisher Company, Providence, R. I., plans to concentrate its home works at the Auburn, R. I., plant, a property acquired some two years ago of the Washburn Wire Company and greatly enlarged, most of the work being done after dull times had begun. The Carpenter Foundry at Providence, owned by the company, will be retained as at present, though probably on job work largely, as the new foundry at Auburn has large capacity. It was planned originally to retain the Providence shops on West Exchange street and devote them to the manufacture of brass goods, especially those which form parts of supervisory alarm systems. Other lines to be added to the product later were to be made there, as well as brass parts of fire extinguisher systems in general, including sprinklers. But this plan has now been changed and the property is offered for sale. The company is now employing close to 1000 people, all but about 400 of them at Providence. When the concentration has been effected the Auburn Works will have all of these, with the exception of some 200 employed in the Carpenter foundry. The Auburn plant is large, and will permit of a considerable increase of working forces, even when the force at Providence has been moved.

The New Departure Mfg. Company, Bristol, Conn., is planning to make still further expansion of its works this fall, additional manufacturing space being needed badly, and it is expected that 1000 men will be employed before the end of the year, an increase from the present 700. One reason for the proposed expansion is the demand from the automobile trade for the company's roller bearing, the works being far behind orders in spite of the fact they are running 22 hr. a day.

The Monarch Valve & Mfg. Company, Warren, Mass., is considering a proposition of the Board of Trade of Chicopee, Mass., to move its business to that city, plans of new buildings having been prepared. The company manufactures bronze and iron gate and globe valves. The business has grown rapidly and new capital has become interested and increased facilities will soon be necessary.

Surveys are in progress in West Rutland, Vt., for a new steam railroad to give access to nine miles of marble lands in the towns of Tinmouth and Danby, and furnish marble for the plant of the Columbian Marble Company, Rutland, which, according to the report, is to change ownership. The estimated cost of the railroad, according to the dispatch, is $1,000,000. It will connect with the Delaware & Hudson at West Rutland. The plan is to build a spur from Granville, N. Y., later.

Announcements of enlargements in industries outside of the metal trades include the following: Butler Cotton Mills, New Bedford, Mass., two story brick addition, 98 x 128 ft., for weave shed, and one-story addition, 27 x 43 ft., to boiler house; American Velvet Company, Stonington, Conn., proposition to Stonington Building Company, owner of buildings, to erect an addition 100 x 125 ft.; Woronoco Paper Company, Holyoke, Mass., building, 50 x 100 ft., four stories; Worcester Wadding Company, Worcester, Mass., Nathan Pemstein and Abraham Solod, owners, works at Charlton, Mass., to manufacture wadding.

The H. A. Matthews Mfg. Company, Seymour, Conn., manufacturer of sheet steel bicycle fittings and stove trimmings, has increased its capital stock from $90,000 to $125,000. The company is preparing to enter more extensively into heavy stamping for automobile parts and other purposes, and is erecting a concrete building which will give 12,000 sq. ft. of new floor space.

The Brown & Sharpe Mfg. Company, Providence, R. I., is beginning the establishment of a central power station, present building operations being a part of a series which in the end will include the entire plant. The work for this season will include the erection of an engine room, 42 x 50 ft., and boiler room, 50 x 68 ft., both of brick, with concrete foundations and fireproof throughout. A brick chimney has already been erected 150 ft. high, with an inside diameter at the top of 90 in. The boiler room will be equipped with 400 hp. of Sterling boilers. Artesian well water will be furnished for the boilers and purified by a Harrison Safety Boiler Works feed water heater and purifier. Taylor automatic mechanical stokers will be installed, fed from overhead bunkers. The engine room equipment will consist of a Rice & Sargent 200-hp. engine, a 150-hp. compound, steam driven Ingersoll-Rand air compressor, a 100-kw. and a 80-kw. generator, both of which will be belt driven from the engine and will furnish power to be used wherever needed in the works. The air from the compressor will be employed in the foundry for operating sandblasts and pneumatic chisels, and for the air lift used in the artesian wells. The engine room will be equipped with a 15-ton traveling crane.

The Atwater Mfg. Company Southington, Conn., manufacturer of carriage hardware, has made radical changes in its officers, including the election of Richard Elliott, who recently purchased a controlling interest in the company, as president and treasurer. Thomas F. Welch was made secretary, and the remaining directors are Marcus H. Holcomb, Bradley H. Barnes and Merit N. Woodruff. All are residents of Southington.

The new foundry of the Pequonnock Foundry Company, Bridgeport, Conn., will require 50 hp. equipment for its new foundry, the contract for which has been let, and later on an air compressor and sandblast will be purchased. All other equipment will be furnished by the Whiting Foundry Equipment Company.

The J. C. Barrett Company, 308 Pearl street, Hartford, Conn., manufacturer of patterns and models, is in the market for a second hand jointer, about 16 in. The business has just been incorporated under Connecticut laws, with authorized capital stock of $25,000, of which $5000 will be issued in the beginning. John C. Barrett is president and treasurer, John M. Taylor vice president and Harry B. Horne secretary. The business will be increased to the extent of better equipment for its work.

The Automatic Machine Company, Bridgeport, Conn., has sold its old plant and the old machinery of its new works, the Pacific Iron Works, preparatory to moving into the reconstructed plant.

The new foundry of the Holyoke Motor Foundry Company, Holyoke, Mass., will be 80 ft. square and one story, of steel and concrete. Details are in the hands of the contractors, the General Engineering Company, New York.

The Messalonskee Electric Company, Waterville, Me., will soon ask for bids for a new power house to develop a water power on the Messalonskee River.

The Massachusetts Box Company, Everett, Mass., will erect a new shop building, 40 x 110 ft., equipped with modern machinery, to replace the plant recently destroyed by fire.

Chicago Machinery Market.

CHICAGO, ILL., August 31, 1909.

Machinery dealers report a very good business for the past week, with a general improvement in all lines. Manufacturers and other buyers in nearly every line of trade are revising their plans from time to time, and find that they will need more equipment for their shops, and many new projects are assuming tangible form. The automobile manufacturers seem unable to make their plans sufficiently comprehensive to cover their requirements for 1910, and each week brings new inquiries in this line. Some very satisfactory orders have also been received from car builders within the past week, with many inquiries pending. The railroads are generally making improvements in their car shops. There is much talk of a car shortage, and, while this is not taken seriously, in some quarters the operating officials of the railroads feel just a little uneasy and are looking carefully after their facilities for repair work. It is understood that contracts have practically been closed covering the Central of Georgia's list, which has been pending for several weeks. The business will amount altogether to about $200,000 and will be divided among several machinery firms.

The Hill-Tripp Pump Company, Anderson, Ind., has been incorporated with a capital stock of $30,000, to manufacture a vertical thrust rotary pump. The pump is at present being manufactured in the Hill Machine Company's shops, but it is probable that a plant will be provided for its manufacture in the near future.

The Warner Electric Company has been purchased by the Warner Gear Company, Muncie, Ind., and incorporated with a capital stock of $100,000, under the same title. The company, which will be devoted to the manufacture of electrical appliances, is planning the erection of a large factory, plans for which have not been determined upon as yet.

The Zumbro Power Company, Rochester, Minn., having recently incorporated with a capital stock of $300,000, is preparing to install a power plant on the Zumbro River. Equipment required for the plant will include two 600-kw., 60-cycle, three-phase alternating and one 300-kw., 60 cycle, three phase direct current generators, three sets of turbine water wheels, 14 miles of three wire transmission and transformers.

The Valley Power Company, Cashmere, Wash., is increasing the capacity of its plant by the installation of a 550-kw. generating unit, which has already been contracted for, but the company will be in the market in the near future for a unit of like capacity.

Present plans of the Grand Junction Electric, Gas & Mfg. Company, Grand Junction, Colo., include the installation of additional machinery, the exact nature of which has not yet been decided upon.

Bids are to be taken about October 1 or before for four 400-hp. boilers, steam turbines aggregating 1300 to 1500 hp., or Corliss engines, generator of corresponding capacity, 40 to 50 alternating current motors, feed water heaters, pumps, blowers, condensers, separators, conveyors, pulleys, hangers, dust collectors, ventilating fans, hand crane, hoist, &c., for the State prison shops at Oak Park, Minn. Charles L. Pillsbury, Minneapolis, is the consulting engineer, and through him exact specifications can be obtained at the proper time.

Among municipal electric light and power plants recently authorized for construction or improvement, new equipment for which will be needed shortly, are: Goshen, Ind.; Antlers, Okla.; Glendale, Cal.; Elburn, Ill.; Yale, Mich.; Water Valley, Miss.; Russell, Kan.; Buchanan, Mich.; Thurmont, Md.; Tyler, Minn.; Mt. Olive, Miss., and Durant, Okla.

Milwaukee Machinery Market.

MILWAUKEE, WIS., August 31, 1909.

No topic of general interest is receiving more attention from Wisconsin manufacturers at the present time than the question which has arisen concerning the development of water powers within the State. For the past fortnight a special committee of the Legislature has held daily sessions on the subject and men representative of various industries have given their views in relation to the matter of State regulation. With practical unanimity they declare that the building of hydro-electric plants, supplying power to industrial communities, should have every possible encouragement by the authorities, and the existence of any water power trust in this section is vigorously scouted.

Thus far the greater part of the water power developed has been used directly for manufacturing, and numerous plants in districts widely scattered, including shops of the metal working industries, are now dependent upon it for economical operation. With this power interior cities, such as Wausau, for example, are destined to become large centers of production.

To other communities water power stands as a reserve in case of necessity. For example: Should the power plant at the great works in West Allis become disabled from storm, fire or other cause, current could instantly be switched on from the hydro-electric plant at Kilbourn, Wis., over 80 miles away, the connections being already made; and the same is true of numerous smaller shops within an equal radius, so far as transmission lines have been carried.

During the long period of depression an important aid to Wisconsin contractors and builders of machinery was the large percentage of orders received from municipalities, townships and sanitary districts, which took advantage of the low prices then prevailing to effect many permanent improvements. With better times prices have advanced sharply, and most of the older contracts are filled, but, so far from diminishing, the demand from the same source has about trebled, being stronger now than local firms have ever known it. The structural iron and steel companies, bridge, viaduct and culvert builders share, of course, in the activity, and are also busy filling orders from the steam and electric railroads, industrial works, &c.

Machine tool builders say that much better prices are now obtainable than were current a few months ago, and for quick delivery there is sufficient premium to warrant the very considerable expense of running overtime, or with night shifts.

Some of the smaller shops, which have heretofore contented themselves with custom and repair work, are making preparations to manufacture regular lines, such as pressure pumps, accumulators, hydraulic presses, power presses, punches, die presses, bulldozers, riveters, filter presses, drills, cutters, shears, grinders and other apparatus of general utility. So widespread is this movement, not only here, but also in smaller cities, that within a year Wisconsin will undoubtedly have advanced materially in the list of States producing metal working machinery, so far as percentage of output is concerned. As an aid in this direction, the tremendous development of water power, above alluded to, will play a prominent part.

A steel frame building, 120 x 300 ft., with power plant of separate construction, will be erected by the Paine Lumber Company, Oshkosh, Wis. New planing mill and woodworking machinery, saw tools, motors, &c., will be among the company's requirements.

The Sailer-Whitmore Machine Company, Menasha, Wis., has had plans prepared for a foundry, 60 x 120 ft., with steel trusses and columns. A traveling crane and the usual complement of foundry apparatus will be needed.

Two steam boilers and an engine of about 150 hp. will be purchased by R. H. Schmidt, Sheboygan, Wis., for a new plant in which he is interested. Address in care the Sheboygan Fruit Box Company.

The De Pere Electric Company, De Pere, Wis., will install alternating current generators to replace the direct current machines now in use.

The McDonough Mfg. Company, Eau Claire, Wis., has contracted for building and equipping the new mill of the Diamond Lumber Company, Green Bay, Wis.

Five boilers of 625 hp., a 500-hp. Corliss engine, electric generators and a line of motors will be installed in the new plant of the Mandt Wagon Company, Stoughton, Wis.

Engineers of the Chicago, Milwaukee & St. Paul Railroad are making estimates on the cost of building power stations and operating trains by electricity through the long

tunnels of the mountain divisions of its Pacific Coast lines. Should the project be carried out, manufacturers in this section are likely to furnish most of the machinery needed.

Plans have just been completed for the new central power plant of the Kimberley-Clark interests at Appleton, Wis. Four hydraulic turbines, with generators and a large motor equipment, are to be installed.

A Corliss engine of 150 to 200 hp., boiler, feed pumps, condensers, generators, telpher system, power transmitting apparatus, &c., are to be purchased by the Menasha, Wis., Paper Company for use in the new mill at Ladysmith, Wis.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 31, 1909.

As far as manufacturers of machine tools are concerned, the volume of business booked in August will show a decided gain over the previous month. Merchants have probably not experienced the same consistent gain, as some irregularity is to be noted. In the aggregate, however, the volume of the orders booked will compare favorably with those taken in July. There is more life in the market, and a number of concerns, owing to the increasing volume of business taken, have come into the market for equipment of various kinds, desiring prompt shipment in order that their own work should not be delayed. Sales of a number of the heavier tools have been recently reported; planers have been quite active and a good demand is still noted. The scarcity of certain makes of milling machines is sharp, deliveries being delayed for six to ten months, dependent on sizes. This is particularly the case in certain makes of Western milling machines. Quite a few sales of heavy radial drills are also reported. The demand is still largely for single tools, for which buyers come into the market as fast as they find the necessity for additional equipment. Few large propositions are under consideration, although some better business is in sight. The railroads are showing more disposition to come into the market. Shipyards show a decided betterment in point of activity, and several of the local yards look forward to further Government orders, which will keep them well engaged for some time.

Most manufacturers will show a larger volume of new business on their books than was placed the previous month. Practically all are putting on additional mechanics and plants are better employed. In some instances sufficient business to keep plants going quite comfortably for six months is reported. The increased activity in the crude and finished iron and steel lines is viewed with considerable encouragement by the trade, and the fact that many industrial plants are now running close to normal is expected to lead to increased buying of machine tools in the not distant future. Prices for some classes of tools show a decided hardening. Some makes of milling machines have been sharply advanced, while a few other specialties have also been marked at slightly higher figures.

Little change is observed in the foreign demand. Occasional orders for special tools are noted, but this class of business is quiet.

The engine and boiler trade shows some betterment; an improved demand for both medium and high power equipment is reported. Sharp competition is reported in some lines. Second-hand boilers have been active, but there is little movement in second-hand engines. Second-hand machinery merchants report a fair run of business, but the market still shows irregularity.

Both iron and steel casting plants are taking on an increased volume of business. Some steel casting plants are operating almost to normal capacity and have a good tonnage of orders on their books. Gray iron foundries are not gaining quite as rapidly as the steel casting plants, but they are melting considerably more iron and the outlook for business is very encouraging. The demand for machinery castings shows improvement.

Property having a frontage of 72 ft. on Twelfth street, between Pearl and Wood streets, has been purchased by J. H. Smaltz of Smaltz, Goodman & Co., shoe manufacturers, and plans are being made for a 10 or 12 story reinforced concrete manufacturing building on the site, which has a depth of about 125 ft.

The Atlantic City Electric Company, Atlantic City, N. J., contemplates the erection of a new plant in that city. E. M. Plummer is chief engineer of the company.

The Newton Machine Tool Works, Inc., notes a very satisfactory volume of inquiries for its varied tools. A good number of orders are being taken and the working forces are being steadily increased. Sufficient business is now on the books to keep the works well occupied for the next five or six months.

Ballinger & Perrot, engineers, have awarded a contract for the erection of a large addition to the plant of F. M. Tunnel & Co., at Wheatsheaf lane and Zaul street, to Joseph Bechtel, contractor. The plans call for a reinforced concrete building of various hights, covering an area of 100 x 300 ft., replacing frame buildings recently destroyed by fire. The same engineers have also completed plans for additions to the main building and foundry, as well as a new two-story building, for the Bernstein Mfg. Company, Third and Westmoreland streets.

The Pennsylvania Railroad has awarded a contract for the erection of a complete pressure wood preserving plant at Point House Pier, Greenwich Point, this city, where the company now has a small experimental plant in successful operation. The plant will be built similar to the company's present plant at Mt. Union, Pa. The building will be 50 x 150 ft., of steel and corrugated iron construction, and absolutely fireproof. In connection with the plant there will be a tie and timber storage yard of 25 acres on the Delaware River front, with storage tracks and a 24-in. gauge industrial railway. In addition to ties, other classes of material, such as bridge timbers, telegraph poles, cross arms, planking and shingles will be treated. The capacity of the one treating cylinder to be installed will be from 750,000 to 1,000,000 ties per year.

Government Purchases.

WASHINGTON, D. C., August 31, 1909.

Bids will be received until September 30 at the office of the United States Engineer, Boston, Mass., for boilers, engins and generators for the Philippine Islands.

The Isthmian Canal Commission will soon ask bids for an 18-in. pipe line dredge, one engine to be horizontal with double cylinder, 10 in. diameter by 12 in. stroke; one 10-ton traveling crane and tracks for dredge, the crane to be supported on two 12-in., 35-lb. I beams, and other supplies.

The following bids were opened August 23, Circular No. 527, for machinery for the Isthmian Canal Commission:

Class 1.—Two air compressors—Bidder 2, Allis-Chalmers Company, Milwaukee, Wis., $20,000; 18, Chicago Pneumatic Tool Company, Chicago, Ill., $13,600; 24, Drew Machinery Agency, Manchester, N. H., $18,760; 40, Ingersoll-Rand Company, New York, $18,220, $15,640 and $14,436; 41, Jeansville Iron Works Company, Hazelton, Pa., $10,500 and $11,300; 46, Laidlaw-Dunn-Gordon Company, New York, $13,130 and $12,630.

Class 2.—One marine feed water heater—Bidder 1, Alberger Condenser Company, New York, $450 and $435; 29, Fox Brothers & Co., New York, $680; 35, Griscomb-Spencer Company, New York, $1400; 52, Manning, Maxwell & Moore, New York, $448 and $433; 56, Motley, Green & Co., New York, $450 and $435; 70, Schutte & Koerting Company, Philadelphia, Pa., $2450; 80, Universal Trading Company, New York, $447.48 and $429.90; 83, Henry R. Worthington, New York, $707.

The following bids were opened August 24 for machinery for the navy yards:

Class 91.—Two electric hoists—Bidder 64, Hoisting Machinery Company, New York, $321; 104, Niles-Bement-Pond Company, New York, $450; 132, Sprague Electric Company, New York, $396; 162, Yale & Towne Mfg. Company, New York, $430.

Class 101.—One universal milling machine with spare parts—Bidder 9, Brown & Sharpe Mfg. Company, Providence, R. I., $2674.73; 44, Fairbanks Company, New York, $2999.12; 87, Manning, Maxwell & Moore, New York, $2298.88; 104, Niles-Bement-Pond Company, New York, $2584.30.

Class 111.—One 6-cylinder gasoline engine—Bidder 55, Gas Engine & Power Company, Morris Heights, N. Y., $6203; 102, Murray & Tregertha Company, South Boston, Mass., $5940.

Class 161.—Two 7½-hp. motors and spare parts—Bidder 36, Diehl Mfg. Company, Elizabethport, N. J., $1170.40; 46, Fort Wayne Electric Works, Fort Wayne, Ind., $709; 54, General Electric Company, Schenectady, N. Y., $965.

Under bids opened July 19, Circular No. 516, for machinery for the Isthmian Canal Commission, the bids of Henry R. Worthington, New York, have been accepted as follows: D, for pumps, engines and boilers, $133,176; F, motor equipment with one extra unit, $46,467; G, for monitors, &c., $10,205.

Under bids opened August 10 for machinery for the navy yards, the Chicago Pneumatic Tool Company, Chicago, Ill., has been awarded class 71, six pneumatic emery grinding machines, $80.

The Battleship South Carolina.

The battleship South Carolina, built by the William Cramp & Sons Ship & Engine Building Company, Philadelphia, on August 28 completed a successful trial trip, in which it was demonstrated that the vessel is the fastest ship of its class in the navy. In the four-hour full speed run the South Carolina made 18.88 knots, the contract requirement being only 18.5 knots. In the five high-speed runs over the measured mile the battleship attained a mean speed of 19.25 knots. During the standardization run the South Carolina's fastest mile was 20.52 knots. The coal consumption of the battleship likewise was superior to that of other ships in the four-hour trial, only 1.39 lb. per indicated horsepower being used. In the 17½-knot trial for 24 hours the South Carolina, besides maintaining a speed average of 17.6 knots, burned but 1.85 lb. of coal per horse-power.

HARDWARE

EXPORT trade in Hardware suffered last year as did that in most other articles of American manufacture. By this is meant that the aggregate business for export did not reach the totals recorded for the year and two or three years previous. But manufacturers who express disappointment over the curtailed trade of last year are apt to forget that in many instances our exports for the year previous were record makers, and so fast does time fly, and so prone are we to forget the days of small beginnings, comparison is seldom made of the business of 1909 with that of 1899, for example. As a matter of fact, foreign shipments of American Hardware last year, in spite of depression at home and throughout the world, were not far from double those officially recorded 10 years ago. To take a specific example: For the fiscal year ending June, 1909, of Builders' Hardware, Saws and Tools, our exports amounted to $12,136,577. For the fiscal year 1899 the figures for the same lines read, $7,842,372. In spite of depression, then, we exported over four million dollars' worth more last year than we used to sell to our foreign customers, although even in the '90s we felt that we were enjoying a large and lucrative business. If we turn to Cutlery we find an even more impressive state of affairs. In Table Cutlery we last year exported $56,953, but in 1899 our exports were only $3473. Under the heading "all other Cutlery" official statistics for the 12 months ending in June read $802,727, which contrast most favorably with the figures for 10 years ago, which were $164,603. It would be interesting to know to what extent the vogue of the Safety Razor has contributed to our latest figures, which make a new high record in this line.

If any argument ever were needed as to the desirability of foreign outlets for American goods, nothing could be more impressive than this—that with dull times, financial stringency and a dearth of orders here at home, our manufacturers of the goods just enumerated were the richer by the profits on about five million dollars' worth of their products than they would have been under similar circumstances 10 years ago, and our workingmen were the gainers by the proportionate share in that trade paid out for labor. Some part of that five million dollars went toward paying rents, another part was passed along to suppliers of iron and steel and other materials. However much we may bewail the fact that our foreign business in 1909 was not equal to that of 1908, nevertheless the fact remains that we drew about twice as much money from customers overseas as we did 10 years ago. Moreover, we are more than holding our own in the race for the world's markets. The British Hardware trade and the German trade suffered last year quite as acutely as did our own, for all international trading was seriously curtailed.

Now that the time has at length returned when orders are once more plentiful from our closest and, therefore, dearest customers, those in our own country, the lesson of that extra five millions last year ought not to be lost. Manufacturers owe it to themselves and to their employees to take such steps as may be necessary to provide that when a time of leanness again arrives, as it is morally certain to arrive with the passing of the years, our great export trade shall be an even more important reliance. This is not to be accomplished by a show of supercilious indifference to export demands when times are "good" here at home. Export trade cannot eternally propagate itself. We have done well in it; we can do far better. Success in it will follow the devotion of care, thought, ambition and effort. Trade in Australia and trade in Texas differ in minor points only. To acquire and to develop either means intelligent effort. When the Galveston man is neglected his custom is lost, and so with the Sydney man. This warning is not so necessary now as it was, say, five years ago. An extra business of five million dollars is well worth the having. We cannot complacently contemplate the possibility of its loss, especially at a crisis, and we know that crises periodically arrive.

Condition of Trade.

Apparently no hesitancy is experienced in the orderly development of a sound commercial situation, not alone for the remainder of 1909, but for the next year or so, if the forecasts of shrewd manufacturers and merchants are correct. Business is still far from being in full swing, but it is broadening and gathering momentum despite the absence of a section of that class, relatively small, but to whom important propositions are eventually submitted for approval; a group of individuals the lack of whose assent temporarily defers decisive action. Prices are hardening with some advances and more are foreshadowed by withdrawals of prices. The higher prices for raw materials will later be reflected in higher prices for finished products, but which necessarily require more time for adjustment. The prevailing estimate of moderate stocks available throughout the trade, from maker to final distributer, has some confirmation in the increasing demand for prompt shipments. Salesmen are calling attention to urgent requests from customers to anticipate their customary visits. Traveling selling representatives covering Western territory refer to the favorable indications for a good trade, particularly west of Chicago. One organization of importance, having outstripped its record in May and June, the greater being May, finds that July is second only to May, and August is certain to be in the same class, its immense plants now running full time with the output already a half month behind in staple lines. The degree of confidence felt by a representative industry, operating several factories, regarding the future, takes the practical form of preparations to add this fall an increased producing capacity at one plant, which will require the equivalent of over an acre of floor space and where labor saving machinery predominates. One enterprise is in receipt of an order which is the largest single requisition ever received in the history of a business established early in the last century, necessitating deliveries for the ensuing 10 months and which will tax to the utmost some departments of the works, operating day and night. Its books now contain orders of sufficient magnitude to run the various factories well into next year if no other business is booked. There are advices in some quarters of business enough ahead, coupled with inquiries and intimations from responsible sources, of what will be wanted, but not definitely determined, to warrant preparations for enlarged production. A business sustained by a group of factories variously located shows a gain for the past 11 months of a third over the corresponding period of a

year ago, and the results for the full 12 months are estimated to increase the gain to one-half in comparison with the preceding year. Still other plants with heavy output are crowded with orders and are months behind in deliveries.

Cleveland.

W. BINGHAM COMPANY.—The era of prosperity is certainly with us and the reason is very simple. The business men of the country have taken hold of affairs now and everything is running smoothly, safely, sanely and conservatively, and we do not think any political party will dare to antagonize any organization made up of business men to better business conditions.

Immense railroad building possibilities are looming up in China. Consular reports show that American merchants and manufacturers are getting a stronghold there. Just stop and think of the great commercial possibilities before us in the numerous supplies of all kinds that 430,000,000 Chinese are wanting right now, and with the opening of the country and enlightenment of the people they will become Americanized in their ideas and their wants will multiply. It is said that the Chinese are a migratory people and if they are given facilities to get about in their great empire it is believed they will take readily to railroad travel, and people and merchandise will be moved back and forth in the interior country as well as toward their seaports. China will be a splendid country to dump a large part of our surplus manufactured goods, and if American manufacturers will only take hold of the matter in the right way they can do it. We are not only immense consumers, but South American and Oriental markets are going to be a favorite dumping ground in the future for our surplus.

The general Hardware trade in this section is in splendid shape. Orders are numerous and well assorted. It is not so much a question of price as it is "Have you the goods and can you ship promptly?" A Michigan customer writes to one of our salesmen, "Come over and see me at once. Have an order for Hardware that we would like to give you for quick shipment." Another salesman in New York State writes: "I have been very busy ever since my vacation. I have been written and telephoned to from all directions. One customer writes, 'Get here quick. We want to buy some goods of you.'" So it comes from all directions. We do not mean by this that we are the only jobbers selling Hardware, but what we are trying to emphasize is that all over the country stocks are low and customers who have been buying of certain jobbers and know what they can furnish are calling upon them to be served promptly.

As we have said in some of our previous letters to *The Iron Age*, we believe there is going to be quite a decided change in prices on many goods. Manufacturers for the most part are withdrawing prices in standard goods. We have just received a letter from one of the largest Hinge manufacturers stating that all prices on Strap and T-Hinges and Butts are withdrawn. We do not want to give any one the impression that there are not enough goods to go around, but we do wish to convey the idea that manufacturers, wholesalers and retailers have come to their senses and realize that they have been handling a good many commodities without a reasonable profit and are now calling a halt. While we are willing to give the farmer his slice (which, by the way, in the last two years has been a big one), still manufacturers and merchants want a little bit off the top themselves.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—We are having such a hot spell of weather that we are firmly convinced we cut our vacation too short. As we never seem able to dodge committee meetings by being out of town at the appointed time, no more can we escape this bodily infliction of a summer roast. The thermometer seems bound to remind us of how frail or fluid we are. Our St. Louis friend puts it that "Every dog has to have his day," even if his preference this time of the year is for nightfall.

The worst of it is to think that these same nearby neighbors of ours, who vitiate our good Ohio River water with Mississippi undercurrents, according to report in *The Iron Age*, have filled up the hotels at Rye Beach, Magnolia, Bar Harbor, &c., Newport being understood, leaving out of consideration those of the swells who went to Europe, so that the Kentucky people who are fortunate enough to get away at all have to turn to their old, well established haunts, the Mammoth Cave, Blue Lick, Salt Lick, Red Sulphur, Olympia, Tatham, Grayson and Dawson Springs, not to mention French Lick across the river and "The Warm, the Hot and the Healin'" Springs, Virginia, as the stage drivers used to call them out at Allegheny.

We think we are doing mighty well when we get a chance to go up and play a game of pool for diversion, or take a dip in the swimming tank for our health. It is astonishing what a change of air and diet will do for a man when he is really bent on having a good time. To change off from bouillon to batter cakes and fried apples means something, and we can afford to gather a few ticks and chiggers on our epidermis along with asters and goldenrods and blackberries in the thickets.

The convention of Advertising Writers is here in full force, and is making a record for itself, along with the thermometer at 98 degrees or thereabouts, possibly marked down from 100 degrees. The association has been royally entertained by our newspapers and by the local organization. If the children of Israel were sent forth and charged to multiply, they were only the forerunners of these gentlemen whose days are full of ads. It is a wonderful development when we think of it, this employment of high grade talent to set forth the reasons why such a motor car should be our preference instead of some other one, or why we should drink Voca-Vola when weary, or that the admonishing finger of the wonderful discoverer of the virtues of pawpaws should be borne in so unforgettably upon us all. "There is a reason," says the anticoffee man, and it takes more than the regulation *pousse café* to make us forget that all of our woes come from indulging in that seductive drink.

Mr. McClure gave us a talk at the grand banquet on the making of a magazine. Just as to the process of avoiding the ever glad hand of the court receiver we cannot say so much, but as to the makeup of the modern magazine Mr. McClure might have chosen to define it thus: A fancy cover; goil and apple trees preferred for summer; goil on skates for winter; 20 pages of advertisements of books, schools and financial temptations away from home; 80 to 100 pages of reading matter disposed around alluring pictures, the climax of the photographers' and engravers' art; 60 or more pages of a carnival of advertisements, notably soap, shoes, corsets, confections, college youths clad in creased trousers and negligee coats, breakfast cereals, &c.; concluding with cover page with blonde emerging from motor car, limousine, *finis*.

Baltimore.

CARLIN & FULTON.—While trade conditions are undoubtedly much better, there has not yet been the improvement to justify the great advances that have occured in the stock market since July 1, and the inflated values of many securities have been the result of exaggerated expectations as to the return of the prosperity which existed in the business world during the year 1907.

Trade is undoubtedly increasing everywhere throughout our country. The railroads are preparing for an immense business resulting from the transportation of the crops which are to be marketed during the coming fall. The demand for labor is increasing steadily, the agricultural sections of the country have been blessed by abundant harvests with rare exception, building operations having increased to such an extent as to justify an advance in the cost of Builders' Hardware, and while all these are evidences of good and better times, it would be unfair to put upon legitimate business the responsibility for either an unwise inflation in stocks, or for a depreciation which is found to follow such a market as we have seen on the stock exchanges throughout the country.

The large purchases that are now being made by the railroads of rolling stock and rails indicate very forcibly the expectations of the great lines of transportation as

to the increase of business, while the continued improvement in bank clearings throughout all the large cities also shows the growth of business.

For several weeks the hotels of our city have been filled with merchants visiting here from all over the South, mostly for the purpose of purchasing such lines of goods as require personal inspection, such as dry goods, notions, clothing, boots and shoes, &c., and the number registered at the rooms of our Merchants' and Manufacturers' Association up to the present time is almost double the arrivals up to the same date last year, indicating a much greater general activity in trade.

In former times when Hardware was carried very largely by general merchants prior to its becoming specialized, the buyer who visited the large city always bought with his dry goods, notions, &c., a stock of Hardware adapted to the wants of his locality, but since the development of the exclusive Hardware store the buyer generally purchases from the catalogue or the visiting salesman, which unfortunately adds to the expense of doing business, the payment of traveling expenses and hotel bills. Of course, it would be impossible to return to the old methods of business, but we also regret that the average buyer does not more frequently come in personal contact with those from whom he purchases, as it would undoubtedly result to the advantage of both the buyer and seller.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—Early in the year the writer said that everything looked extremely favorable in the Pacific northwest, and he has been reiterating this again and again. Now that our crops are almost in we can only say that our highest expectations have been more than realized so far, and we believe that prosperity will continue to increase as the year draws to its close.

The one element of this prosperity which will be effective even more next year and in the years to come is one that no one counted on until recently. The Hill and Harriman interests are now fighting to enter the hitherto undeveloped country of eastern and southeastern Oregon. This is a wonderfully productive country and has been for years the largest section of fertile country in the United States without a railroad. Unless all signs fail this condition will soon change, which will mean new homes for countless thousands and new business for all the cities of the Pacific northwest.

Due to this railroad activity and to the good prices for all our crops, there is plenty of ready money in the country, and our collections are even better than usual at this time of the year.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—For the past 30 days a large part of this Western territory has suffered from very hot weather and a severe drought. This condition has had a perceptible and unfavorable influence upon trade. The situation is very spotted; we never saw it so spotted before. Reports of fine crops will come from one county in a certain State, while the adjoining county reports everything burning up. Under such conditions it is quite difficult to figure out accurately just how much damage has been done.

Business continues in good volume, but there is not the unusually heavy demand we expected as a result of the brilliant prospects for crops 30 days ago.

One of the most certain indications of renewed activity in this city is in the fact that our banks, which have been burdened with too much money for some time past, are now getting well loaned up. As a result interest rates, which have been very low, are hardening.

We also note the bank reserves in New York are running low. It would seem from a recent report that one big national bank in New York has on hand about 90 per cent. of the total New York bank reserve. One naturally wonders what they are saving up their money for. Is there some big deal to be pulled off, or are they simply holding back for higher rates?

Some manufacturers are already slow in making deliveries, which would indicate stocks on hand are exhausted, and a pressing demand. Our steel friends tell us many of their departments are behind and that manufacturers especially are pressing them for more prompt deliveries. The steel makers seem to be very optimistic in regard to the future demand. They predict a higher range of prices and a heavy business on all steel products the rest of this year and throughout 1910. We sincerely trust their predictions will be verified.

Union Pacific has made a spectacular drop. No doubt the segregation plans will be postponed to some later date. We are sorry for those lambs who were in the market protected by a 10 point margin. No doubt they were shaken out. They won't have much to say except to tell their wives and daughters they must be economical this fall, that probably the old dresses can be made over, that business is dull, and the head of the family—the great local financier—has decided the outlook is very bad.

I sometimes wonder if we haven't too many financiers in this country—too many men trying to make their living by their wits instead of occasionally doing a little hard, honest work. As this army of 10 point financiers is increased, naturally our stock market will be characterized by unusual flurries. Ten point capital is very nervous. Ten point men run at the drop of a hat.

While Mr. Harriman's influence and interests are undoubtedly very large, still it is curious that the condition of one man's health should have such a decided effect upon the securities of this country. What has become of J. P. Morgan? Here in the West we do not hear much of him these days. With Mr. Roosevelt buried in Africa, with President Taft playing golf, with the tariff question settled to the satisfaction—more or less—of all concerned, if it were not for the aeroplanes the newspapers and their readers would have a dull time. But then there is Pinchot's fight, which used up a few columns. What is the use of so many national characters unless they do more to keep we—the people—interested?

I guess we are drifting into a period of you-tickle-me-and-I-will-tickle-you politics. I guess the slogan has been passed along, "Let's all be friendly." We are now living, not in the days of the Big Stick, but of the Big Smile. Somehow we out here in the West miss Teddy. "With all his faults we love him still."

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business throughout the South continues to improve. The fall trade is getting better every day, and merchants are buying more liberally than they have in a long time. The demand for seasonable goods is very heavy. The market is in good condition, and we hear of comparatively little cutting of prices.

Prospects for a big business this winter are certainly bright, and we will be very much disappointed if the Hardware jobbers of the South do not have a record-breaking business this fall and winter and next spring. Just at present the demand for such seasonable goods as Loaded Shells, Stoves, Ranges, Stove Pipe and Coal Hods is very heavy.

We are sorry to say that collections are not so good, but we are looking for quite an improvement in this respect as soon as the money from the crops begins to come in.

NOTES ON PRICES.

Wire Nails.—A large portion of the wholesale trade placed orders during May at $1.60 and $1.70, base, which have been sufficient for requirements, all of which have not yet been shipped from the mills. Buying, therefore, has been comparatively light at prices now ruling. The market is referred to as being in a satisfactory condition. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carload lots to retail merchants	1.85
Less than carloads to jobbers	1.85
Less than carloads to retail merchants	1.95

New York.—The demand during the last week of August was not very brisk in the local market. For small lots at store, Wire Nails are generally held at the base price of $2 per keg.

Chicago.—The mills are receiving a fairly heavy volume of specifications against contracts placed at $1.70, and an increasing number of orders are being entered at the new price of $1.80. It is stated upon competent authority that with very few exceptions stocks in the hands of jobbers are by no means heavy. It is expected, therefore, that, in order to meet the demands of consumers, purchases will increase as the season advances. This movement has been retarded by the heavy buying which followed the reduction of prices in the spring, but the conditions throughout the country are such as to give practical assurance of its development in due time. Prices are firm at $1.98, Chicago, in carloads to jobbers, and $2.03 in carloads to retailers, with an advance of 5 cents for less than carloads from mills.

Pittsburgh.—Large jobbers and the trade generally covered their requirements for several months ahead when Wire Nails were selling considerably lower, and the mills have been busy for several months filling specifications against such contracts. Jobbers are well filled up on Nails at the lower prices, and as a result they have been buying little at the present price of $1.80 per keg. The mills do not expect heavy buying at present prices, but the last advance was made in order to shut off taking more business at the low rate. Trade is in satisfactory condition, with the market firm. We quote Wire Nails at $1.80, base, f.o.b. Pittsburgh, in carload and larger lots.

Cut Nails.—Quoted prices are from $1.75 to $1.80 base, according to the mill. Some manufacturers state that they will make no better price than $1.80 base, while from others, $1.75 base is obtainable, the latter price being slightly shaded only under special conditions. Mills are making shipments on orders received some time ago, while a limited amount of new business is being placed. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

New York.—Nothing has occurred in the local Cut Nail market of particular interest. The demand is moderate at the general price of $2 per keg, base, for small lots at store.

Chicago.—Business continues to expand, the mills are gradually filling up and the market is growing firmer. Jobbers are specifying more freely and prices are less susceptible to pressure than they have been for months. We quote as follows: In carloads to jobbers, Steel Cut Nails, $1.93; Iron Cut Nails, $2.08.

Pittsburgh.—A fair run of new orders is being placed for Cut Nails, and specifications against contracts are coming in at a satisfactory rate. Leading makers of Cut Nails state they are adhering to the price of $1.80 per keg base, f.o.b., Pittsburgh, but in some cases this price is being shaded by a few mills. We quote the market at $1.75 f.o.b., Pittsburgh, and this price is fairly strong, being slightly shaded only in most exceptional cases. Iron Cut Nails are held at an advance of 10c. per keg over Steel Cut Nails, but few of these come into the Pittsburgh market.

Barb Wire.—The fall demand has not yet got into full swing although some new business is being received by the mills. A good trade is expected later in the season. The market is firm and quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.80	$2.10
Retailers, carload lots	1.85	2.15
Retailers, less than carload lots	1.95	2.25

Chicago.—Buying for the fall trade has begun and new orders are being entered at a very satisfactory rate. Business in this line is usually in full swing by this time, but has this season been slow in starting. The prospects are that the demand will rapidly increase from now on, and the mills expect a busy season. We quote as follows: To jobbers, Chicago, carloads, Painted, $1.98; Galvanized, $2.28. To retailers, carloads, Painted, $2.08; Galvanized, $2.38; retailers, less than carloads, Painted, $2.13; Galvanized, $2.43. Staples, Bright, in carloads, $1.98; Galvanized, $2.28; carloads, to retailers, 10 cents extra, with an additional 5 cents for less than carloads.

Pittsburgh.—Little new business is being placed, the demand being seasonable and light as it always is here at this time of the year. The mills expect a good demand when the fall trade opens up. We quote Galvanized Barb Wire at $2.10 and Painted at $1.80, in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Fence Wire.—The market is in good condition with some new business coming to the mills, which are also making shipments on orders received earlier in the season. The market is firm at the following quotations per 100 lb. to jobbers in carload lots as follows, on a basis of $1.60 for Plain and $1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75

Chicago.—The mills are occupied with the execution of old orders, deliveries of which are being urged by consumers. More new orders are being placed, but this movement has not gained full headway. The prospective demand for Fencing, however, is stimulating manufacturers to unusual activity, and the mills expect heavy fall bookings. We quote as follows: Carloads, to jobbers, $1.78, base, f.o.b. Chicago.

Pittsburgh.—The mills have pretty well cleaned up contracts taken in May when prices were somewhat lower than they are now, and are receiving a fair amount of new business at present rates. Specifications against contracts are satisfactory and are very heavy for Plain Wire, the mills making large shipments and running to full capacity. We quote Plain Wire at $1.60 and Galvanized at $1.90, in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Wrought Hinges and Butts.—The market on Strap and T Hinges and Wrought Butts has been uneven for some time, and, owing to keen competition among manufacturers, these goods, in some instances, have been selling below cost. While many buyers have taken advantage of the low prices, some of the manufacturers have not accepted orders for delivery beyond October 1. At least two prominent makers of these goods have withdrawn quotations but have not yet announced new prices, upon which they are now working. When unsolicited orders from customers are received by manufacturers, an advance on former prices is charged.

Rope.—The sale of Cordage during the month of August did not amount to as much as in July, according to one of the large manufacturers. The market is reported as firm on hard fiber products, while Rove Jute Rope is quoted at 5 cents and sometimes lower. The weakness of this line is attributed to competition: The following quotations represent the market for moderate quantities: Pure Manila of the highest grade, 8¼ to 8½ cents per pound; lower grades of Pure Manila, ¼ to ¾ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7½ to 7¾ cents per pound, base; Commercial grade, 6¼ to 6½ cents per pound. Rove Jute Rope, ¼ in. and up, No. 1, is quoted at 5 cents per pound.

Window Glass.—The advanced scale of wages to be paid to the skilled Window Glass workmen went into effect on September 1. This, with increased cost of some of the raw material used in connection with Glass making, is regarded as necessitating higher prices at Glass plants if manufacturers are to derive any profit from their product. There seems as yet to be little ground for reporting any marked increase in demand, and the Western Window Glass Jobbers' Association, at a meeting held last week, made no change in existing prices. There appears to be little doubt, however, that a change in prices will show an upward tendency rather than a decline. Those who have analyzed the effect of the advances in wages, state that the heaviest increase will fall on the sizes most generally in demand in the first and second qualities. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains are as follows: New England States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory

shipments, Single, 90 and 45 per cent.; Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts 5 per cent. better than other States; in the Southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 to 90 and 45 per cent. on Double, from jobbers.

White Lead in Oil.—No change in prices took place during the month of August, while the market continued firm owing to the advances in the price of Pig Lead. Demand for White Lead in Oil has been fair, confined mostly to jobbing lots, at regular quotations. Quotations are as follows: In 100, 250 and 500 lb. kegs, 6¾ cents per pound; in 25 and 50 lb. kegs, 7 cents per pound, with the usual advances on smaller packages.

Linseed Oil.—The market has become stronger and more regular during the week and extremely low prices have ceased to be quoted. There is a limited quantity of Seed and Oil to supply all demands until the new crops comes on the market in October, so the situation is also statistically strong. Quotations range, on the basis of 56 to 58 cents, for Western Raw, according to seller, in 5 bbl. lots and over. Boiled Oil is 1 cent advance per gallon on Raw. Demand continues moderate.

Spirits Turpentine.—The market has advanced 1½ cents during the week on Savannah reports of continued demand for home and export requirements coupled with light receipts. Local demand is confined to jobbing lots. The New York market is represented by the following quotations: Oil Barrels, 59½ to 60 cents; Machine Made Barrels, 60 to 60½ cents per gallon.

Shot.—Under the date of September 1, a new schedule of prices was sent out by manufacturers of Lead Shot, showing an advance of 10 cents per bag of 25 pounds on Drop, Buck and Chilled. Dust Shot remains unchanged. Following are the new prices, which are subject, as usual, to a discount of 10 cents per bag of 25 pounds., in ton lots: Drop Shot, sizes smaller than B, 25 pound bags, $1.70 per bag; 5 pound bags, $0.40 per bag. Drop Shot, B and larger sizes, 25 pound bags, $1.95 per bag; 5 pound bags, $0.45 per bag. Buck and Chilled Shot, 25 pound bags, $1.95 per bag; 5 pound bags, $0.40 per bag. Dust Shot, 25 pound bags, $2.30 per bag; 5 pound bags, $0.50 per bag.

Guns and Ammunition.

A Few Hints on Their Care.

BY CAPT. A. H. HARDY.

THE average Hardware merchant is of the opinion that his stock of Ammunition unless cleaned up every year will deteriorate. While there was some trouble with smokeless brands as made several years ago, it will not apply to the product as turned out by the standard powder mills of to-day. It is, however, well to clean up the stock if possible at least once a year, as any sort of goods become shelf worn, and then are not as salable as the newer goods. Another good reason is that every progressive manufacturer is constantly getting out a better label, making it as attractive as possible and giving the goods a better finish.

Cleaning Up Stock.

The writer has had much experience with Guns and Ammunition, and would as soon shoot a shell that had been loaded for five years as one that had been loaded for five months provided it had not been exposed to extreme dampness or heat. Shot Gun Ammunition on account of the paper should be kept in a dry, cool place, and should never be placed on the shelf of an outside wall where it is damp. Although Paper Shells are supposed to be waterproof, and they are as near as paper can be made, it must not be forgotten that paper will always draw dampness. Dampness often causes the Shell to bulge, and the purchaser then compliments the firm in sarcastic terms for sending out such goods, which is not at all the fault of the manufacturer.

Dry, Cool Place for Paper Loaded Shells.

The above reference applies only to Paper Loaded Shells, and has nothing whatever to do with Metallics, better known as Rifle and Pistol Cartridges. This sort of fixed Ammunition as loaded at the factory is regarded as absolutely waterproof. I have shot Cartridges that had laid out all spring in a meadow, where rain had fallen a number of times and did not experience any bad results.

Metallic Cartridges.

Miscellaneous Suggestions.

Guns and Ammunition should always be kept together, as customers for either are usually interested in both.

After a Fire Arm of any kind has been shown to a customer, it should always be wiped with an oiled rag, which should be kept in the case for that purpose.

Never put away a Gun of any kind that has been shot, it matters not whether once or more times, without cleaning it well and oiling it, winding up by using gun oil or vaseline.

Never keep second-hand Guns in with stock of new ones; it gives the former the appearance of a second-hand stock.

Never put a cork in the muzzle of a Gun. The merchant might forget to take it out and the first shot would either burst or put a bulge in the barrel.

If renting out any Guns keep them by themselves.

Do not allow the renter to use black powder; semi-smokeless with the lubricated ball is the best for the Rifle barrel, and the Rifle will not need cleaning during the entire day if the bore is not in a rusted condition. Any bullet not greased will do the Rifle barrel harm. To prolong the life of a Rifle barrel and maintain accuracy use a lubricated bullet.

The average user of a .22 Rifle will run a dry rag through his Rifle and may be apply a few drops of oil and think it is clean. A Rifle barrel should first be wiped with a wet rag, then with three dry ones. A coat of oil should then be applied and later vaseline.

I have seen Rifles brought in that you could hardly see through and the user would explain that it was leaded. This, as a rule, is nothing more than caked powder, and a little hot water will remove it better than anything else. Never use oil on a barrel of this kind until you have removed the caked powder with hot water. If hot water will not remove it then your Rifle will have to go to the factory.

Caked Powder in Barrel.

In conclusion I might add that many merchants complain about the profit they get out of Ammunition, claiming that the manufacturer is too high in price. I have seen some of these same merchants selling .22 Short Cartridges at 25 cents a hundred and Black Powder Shells at 40 cents a box. Now, it would not matter what they paid for the Ammunition; it would be the same thing. There is a reasonable profit in Ammunition and it turns quickly. There is no loss and it is a necessity.

Profits in Ammunition.

The C. W. Greene Company has purchased the business of the Tampa Steam Ways Company, Tampa, Fla. The officers of the new company are: C. W. Greene, president and general manager; E. T. Lewis, vice-president; F. L. Milliken, secretary and treasurer. Mr. Greene was formerly vice-president of the Tampa Steam Ways Company.

The Douglas Hardware Company, Douglas, Ariz., has been purchased by W. H. Fisher and W. de H. Washington.

The Bryan Hardware Company has opened a store in Bryan, Ohio, carrying Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Paints, Oils, Sporting Goods.

B. M. Gilbert has opened a store in Wann., Neb., handling a general stock of Hardware, &c.

Getting Business Through the Mail.

Follow-Up System will Bring Good Returns.

BY S. M. S.

THAT the enterprising Hardware merchant in the smaller towns can build up a successful mail order business is more true to-day than before the rural free delivery system came to be used so extensively in mail order selling. While it is perhaps true the majority of sales are made directly to people who visit the store in person, the indirect results which come from a good follow-up system, together with its mail order sales, make it, in my opinion, a most important but much neglected feature of the retail Hardware business.

I believe those merchants who are inclined to belittle the efficiency of the mail order department judge it solely by the direct orders which it brings in by mail, and give it no credit for the assistance and advertising which it renders the business in general. Then again, many mail order departments are conducted with such little care and lack of system that they fail to receive credit for what they accomplish, simply because there is no provision made to determine what part of the business is secured or increased by it. Letters and circulars are sent out haphazard without regard to any systematic following up of the prospect, consequently the matter sent out lacks intelligent force and is more or less unproductive.

One Point At a Time.

The follow-up mail order system is the growth of recent years. Like everything that marks the progress of the world, it came into existence when it became a necessity. The follow-up system in its beginning is not complicated. It simply consists in assuming that certain people in your territory are interested in your line of goods, and telling them by letter in as short and attractive form as possible why they should trade with you.

NAME Bill Jones ..... BUSINESS Live Stock.
P. O. Brown ..... R. F. D. #4. STATE. Ill. .....
REMARKS. Owns good 50 acre farm on main road. Prompt pay. .....

FORM LETTERS		SPECIAL LETTERS		ORDERS	
Date	Kind	Date	Kind	Date	Article
9/1-07	A	9/9-07	Stove Quotation	10-07	Heat. Stove
9/9-07	B	9/12-07	Cart Quotation	10-07	Bank Mine.

Card for Use in Follow Up System.

Business by mail is called a follow-up system because it is necessary to write more than one letter to a prospect, to give him all the information about the goods you want to sell. Your object is to give them one point at a time, until they see it will be to their advantage to investigate or buy.

You cannot, and you ought not to tell these things all in one letter. Each letter should be different, and all the letters should form one long, connected, interlocking story from month to month. In the end they will produce a cumulative impression. It is not any one letter that makes or improves your business. It is the month after month hammering away, presenting new and different points of view, and always getting down to convincing arguments every time that makes the follow-up mail order system pay.

A Large Appropriation is Not Required

to start with. If your stenographer is not occupied all day, compile a small list of names, either from memory, your ledger, or from the list of tax payers. Enter the names on cards, similar to the one illustrated, and file in a drawer. Arrange them alphabetically, so any card can be found instantly by knowing the name. Let us assume that you have taken the agency for Heating Stoves, and you wish to convert a number of stove "prospects" into customers for your Heater. You begin by sending a descriptive circular of the Heater and writing a form letter, so worded as to interest the prospect, if possible, in the stove. When the first letter (A) is written the stenographer notes the date and letter on the card. At the end of eight days the second letter (B) is written and entered on the card.

Some replies to the A letter are being received by this time, either by mail on in the way of a personal call, and this should be noted on the card and a special letter dictated, or the card filed ahead, to come up about

BROWN, Aug. 18, 1909.

MR. S. M. JONES,
R. F. D. No. 3,
Brown, Ill.

DEAR SIR:

Did you ever stop to figure out how much money you would save if you cut your fuel bills right in half and still doubled the heating capacity of your coal and wood?

But fuel economy is only one of the many reasons why you should own and purchase the Blank Heater, the most economical and efficient Heating Stove made.

To learn detail for detail of the many advantages of the Blank Heater, read the enclosed booklet fully describing this remarkable Stove for burning coal.

Our stock is now complete, and we carry the Blank in styles and prices ranging from $7.50 to $29, and made to burn either wood or coal.

Why not call to-day and let us show and tell you more about the Blank personally, as well as satisfy yourself of its superiority.

Will you do it?

Thanks—

Yours truly,
HARDWARE & CO.

Form Letter A, Bringing Up the Subject of Heating.

the time customer said he would be ready to buy. The stenographer understands that this prevents any further form letters on Heating Stoves being sent, and so omits this card when writing form letter No. 3, at the end of another eight days. The prospect who has had a special letter is treated with a different set of form letters, intended to follow up the special letter and explain further points about the method of doing business. In the same way a Stove order would stop this series of form letters and the date of the order and the article would be entered on the card.

The Secret of Success

in this method of follow-up is the personal nature; therefore, each prospect must be made to feel that you are especially interested in selling him goods, and so far as possible, each prospect must be studied to find his most vulnerable point. When little is known of the character of the prospect the printed, type-written, multigraphed letters are probably as good and effective as any, but when you are writing in answer to an inquiry or have any special data about a prospect, it is far better to write a special personal letter to fit the individual and all the circumstances of the case.

Just how long a prospect should be followed up on one item until he is given up will depend entirely on the article you are trying to sell him, and other circumstances of the individual prospect. In my experience I have found that a series of persistent, yet courteous letters, will rarely fail to elicit some kind of answer, and from this you can easily judge the possibility of final success.

The Why and Wherefore of the Goods.

Your letters and your descriptive matter should not only show your prospect what your goods look like, but should explain to him and show him in just what way

it will benefit him to buy them. If you are writing about a Heating Stove you must give the prospect some idea of its heating capacity, its fuel consumption and all about its make up; the regulation of drafts, dampers and all other points of efficiency. In a series of follow-up form letters, more attractive than fine pictures, more potent than fine language alone are the *why* and *wherefore* of the goods—the reasons.

All form letter argument is simply the setting forth of two main reasons—reasons why the reader ought to buy, reasons why the seller sells. The buying reason is grounded deep in human nature. Readers are not content to be told that a Stove is high grade and is to be sold at a popular price. First, human nature wants to know the price, then it wants to know whether the Stove heats, how much fuel it uses, how long it will last, and what you propose to do about it if it burns out within two or three years. When human nature has all these

BROWN, Aug. 25, 1909.

Mr. S. M. JONES,
R. F. D. No. 3.
BROWN, ILL.

DEAR SIR:

Another most important and vital point to consider when buying a heating stove is the Draft feature.

Start a fire in the Blank and it will be raging hot in ten minutes, yet the dampers can be so regulated that it will keep fire and throw out heat for twenty-four hours with one feeding.

The Blank is the most economical and durable heater made. It gives you perfect control of the fire at all times. Constructed of the best material throughout, it will practically last forever and with less repair bills than any other.

We claim a whole lot for the Blank Heater—and stand back of what we claim. Why not let us place a Blank in your home—you try it—if it don't satisfy you, if it don't do all we claim, we'll remove it.

Call or 'phone us NOW—To-day, while you are thinking of it.

Yours truly,
HARDWARE & Co.

Form Letter B, in Which the "Prospect" Is Followed Up.

facts in hand it can come very close to knowing whether it is worth while to consider buying your Stove or not.

A Secondary Salesman.

The follow-up system is really a secondary salesman. It is expected to go out and tell the story of your business to prospects, as well as customers; to give descriptions, to quote prices and to get orders. I believe it will do all this if it is properly constructed, but in order to do it, it must consist of something more than a mere mass of descriptions and prices. It must embrace good, sensible reasons as to why the Stove described should be purchased instead of that of another make. It must point out the advantages of your Stove and show just where it is to the interest of the customer to purchase it. In a nutshell, it should demonstrate to the prospects the advantage of buying your particular Stove.

Delivery Routes Cabinet And Sash Chain Rack.

AMONG features of special interest on the main floor of the establishment of John S. Menagh, Jersey City, N. J., are the arrangements shown in Figs. 1 and 2. The delivery routes' cabinet, Fig. 1, in which goods to be called for or delivered are placed, stands against the wall at the rear of the salesroom in full view of the office. It is 5½ ft. high, 6 ft. long and 26 in. deep, and stands on a 6-in. base. There are three hinged paneled doors, each 20 x 30 in., furnished with cupboard catches. There is a shelf for goods to be called for, also shelves for goods to be delivered along the different routes. The cabinet keeps the goods out of sight, in good condition, prevents confusion and saves questioning as to where the delivery men are to take the goods.

Another convenient device is the rack for Sash Chain, Fig. 2. This is attached to the right hand end of the delivery routes cabinet by 5-16 x 1¼ in. galvanized bars. The bars are bent at the bottom and screwed to the cabinet. Near the top is a piece riveted to each upright and screwed to the cabinet, thus permiting the lowest

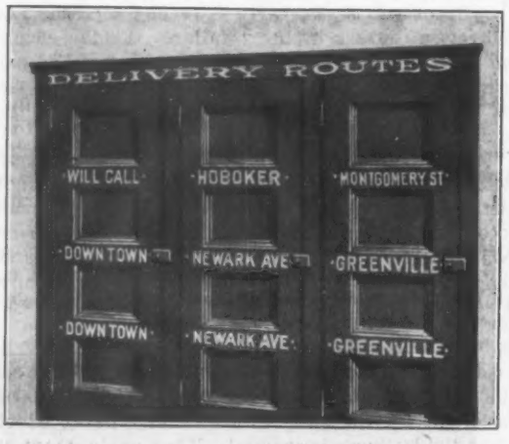


Fig. 1.—Cabinet for Goods to Be Called for and to Be Delivered, Located at the Rear of the Salesroom.—Dimensions, 5½ Ft. High, 6 Ft. Wide and 26 In. Deep.

spool to clear the floor. The rack is long enough to accommodate nine spools and the distance between the uprights is 15½ in. in the clear. Number of size and price per foot of Chain are marked on the end of each spool, and a price-list of all sizes is tacked on the end of the cabinet. In addition, samples of all Chain carried, with tags showing numbers of Chain, are hung on

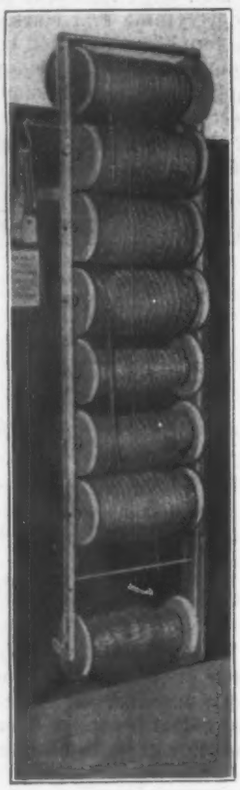


Fig. 2.—Sash Chain Rack, Holding Spools of Bronze and Steel Sash Chain, with Price-List and Samples at the Left, Near the Top.

a hook near the price-list. When a spool is missing from the rack the salesman can show a customer a sample of the missing size and style of the Chain. Holes are drilled in the uprights through which stove rods are run to support the wooden spools.

W. H. McCormick has purchased the business of Fleming & Farmer, Perry, Okla. Hardware, Stoves, Paints and Oils, &c., are carried.

Obituary.

Eugene Bissell.

EUGENE BISSELL died suddenly at his residence in Brooklyn, N. Y., early Saturday morning, August 28, from an attack of heart failure. Friday evening he had entertained at dinner his brother-in-law and partner, Frank Van Name, and, although for some time he had not been in robust condition, he was apparently in customary health.

Mr. Bissell was born in Suffield, Conn., November 1, 1840. In the early sixties he organized the wholesale auctioneering business in Hardware, House Furnishing Goods and related lines, in the conduct of which he had been engaged ever since. His first business establishment was located in Reade street, New York, from which he removed to 12 Murray street, later occupying 15 Park

EUGENE BISSELL.

place, where he remained 21 years. Owing to changed conditions the firm some years since took quarters uptown at 5 and 7 Mercer street, where the business is still carried on.

Mr. Bissell was a man of fine presence, courteous manner, and possessed of qualities that made and retained friends, and his death will be sincerely mourned by many social and business associates. He was a veteran of the Civil War, member of the Sons of the Revolution, Society of Colonial Wars, War Veterans of the Seventh Regiment, Company H Veterans of the Seventh New York Regiment, Company F Veterans' Association Ninth New York Regiment and Lafayette Post, No. 240, G. A. R.

He was also one of the six incorporators of the Hardware Club of New York in 1892 a member of the Board of Governors from the beginning and had been chairman of the House Committee, since he succeeded Peter McCartee in that position about a year after incorporation. In 1907 Mr. Bissell was elected president of the club, being re-elected a year later. Mr. Bissell was long affiliated with the South Congregational Church, Brooklyn, and was on its Board of Trustees.

Theodore F. and Frederic O. Witte.

THEODORE F. AND FREDERIC O. WITTE, sons of the late Ernest Witte, and members of the Witte Hardware Company, St. Louis, Mo., of which he was the founder, were killed in an automobile accident near Creve Cœur Lake August 29. Other victims of this deplorable accident were Theodore Witte's three-year-old son, Theodore F., Jr., his sister-in-law, Mrs. Carl Klinge, and Miss Halcyon Campbell. They were out for a morning drive and were struck by a Rock Island train on a crossing where a view of the track is obscured. All of the occupants of the automobile, with the exception of Theodore, were instantly killed. The latter had both legs broken and suffered other bodily injuries from which he died a few hours later, after removal to a hospital. Theodore was 29 years of age, had been connected with the company 10 years and his marked ability and sterling integrity had won for him the position of head buyer in the Hardware department. Frederic was 27 years old, had been with the company eight years, and at the time of his death had charge of the order department, in the management of which he displayed rare business tact and judgment. Both men were nephews of Otto H. Witte, who is now president of the company. They enjoyed the esteem and confidence of their business associates and employees, and their untimely death is a blow to the organization of which they formed a part and to whose future success they were expected to contribute powerfully.

Abraham Quackenbush.

ABRAHAM QUACKENBUSH died August 26 in his seventy-eighth year at the home of his niece, a daughter of his brother Peter, at Lee, Mass. Mr. Quackenbush was descended from the old Holland Dutch settlers, the family mansion on the Yorkville farm in the vicinity of Second avenue and Eighty-sixth street, New York, making way eventually for paved streets and rows of modern houses, as the growth of population made it necessary. Much of the property is still in the hands of the estate. Mr. Quackenbush was the last male survivor of the family.

Mr. Quackenbush started in business at 20 Cortlandt street in the early sixties, and later moved to 38 Cortlandt street, after Church street was cut through to Cortlandt, succeeding Willis, Cornell & Cary, who wholesaled Hardware.

The house was established as Morgan, Quackenbush & Co., having succeeded to the business of Fox, Oakley & Morgan. On Mr. Morgan's retirement Mr. Townsend, whose father had been prominent in the Hardware trade, was taken into the firm. They remained at 38 Cortlandt street until about 1870, when Sears, Leavitt & Co. were bought out and both stocks were moved to 85 Franklin street, near Broadway. This move proved to be premature, but was made because Mr. Quackenbush noticed then that the tendency with business houses was northward. He was some years ahead of the time, however, and after a few years of slack trade the business was moved down town to 59-61 Reade street.

Among the selling force were such men well known in the trade then and since as Ransom Lamb, Samuel W. Sears, Charles Dale (now with C. E. Jennings & Co.), Henry Hopkins, long editor of *Hardware*, and Mr. Egbert, all or most of whom had been with the house of Sears, Leavitt & Co.

The next purchase was the house of Mulford & Underwood in 1876, who were at 85 Chambers street, running through the block to Reade street, Mr. Underwood remaining with the firm until he died. When the house of Quackenbush, Townsend & Co. retired from business they sold out to Patterson, Harral & Gray, who are still at the old address.

Mr. Quackenbush was a fine type of the old school Christian gentleman, prominent in church and Sunday school work, a man of fine sensibilities, kindly, honorable, of genial manner and a favorite with his employees, although the house did not pay extravagant salaries. He served the city in the old volunteer fire department when Harry Howard was fire chief. Mr. Quackenbush was a member of the Holland Society and long an officer in the Madison Avenue Reformed Church. His wife, Elizabeth A. Louderback, daughter of the founder of the wholesale hardware house of Louderback, Gilbert & Co. (now Sickels & Nutting Company), died a year ago, no children having been born to them.

This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Sales on the Installment Plan.

Form Used by a Virginia House.

We are indebted to a house in Virginia for a copy of the contract form which they use in connection with the sale of Stoves, Buggies, Wagons, &c., on the installment plan. It is presented below in connection with advices from the firm in regard to the success which has characterized its use. The percentage of loss, as noted by our correspondent, is certainly small.

FROM VIRGINIA: We have noticed in *The Iron Age* several different forms used by merchants in the sale of goods on the installment plan, and think they are all right.

We enclose copy of the form we use, and which we have used ever since we commenced business, in selling Buggies, Wagons, Guns and Cook Stoves. Out of about $100,000 worth of these goods sold on this plan, we have lost $250 worth, and it was our fault only that we lost that amount,

This Contract, made this day between ..... of ...., and ....

WITNESSETH, The said ....., party of the first part, agrees to sell to the said ....., party of the second part, one ..... on the following terms and conditions, to wit:

The said ..... agrees to pay ..... cash, receipt for which is hereby acknowledged, and ..... each and every 30 days from date hereof until the sum of ..... has been fully paid. The said ..... retain all right and title to ..... until all payment has been met. If in default the said ..... reserve the right to take the ..... back, and all payment that has been made to be retained by ..... as rent for the time the ..... was used.

We, the drawer and indorser, each hereby waive the benefit of Homestead Exemption as to this debt.

Given under my hand and seal this, the ..... of ..... 190...

WITNESS:

.... [SEAL.]

.... [SEAL.]

Form Used by a Virginia House in Selling Goods on the Installment Plan.

for when the purchasers failed to meet the second monthly payment, we should have taken the goods back. We allowed our customers to keep them until we were forced to take them back, and then they did not bring enough to pay what was owed us on same.

If you hold them up to this contract and take back any article when they miss the second installment, there is no chance of losing anything. We have had this paper tested in several different courts and have always won out.

When we want it discounted we draw a negotiable note at the same time we take the contract, making the note for the same length of time the contract will run, and attach note to the contract, and the bank will discount the note. We do the collecting of the installments and take up the note when it falls due.

Automobiles and Accessories.

The Extent to Which Hardware Merchants May Advantageously Handle This Line.

The question as to the advisability of the Hardware trade doing something in the way of handling Automobiles, and especially the accessories, which was brought up in our last issue, is further discussed in the letters given below. As already noted, a few Hardwaremen are handling the Automobiles themselves and maintaining garages, while a considerably larger number are making a specialty of the supplies, many of which, as pointed out in the letter from an Ohio merchant, are already part of the stock of the up-to-date Hardwareman.

The subject is a practical one in view of the present large output of machines and the great increase in the manufacturers' production which is forecasted for next year. We shall value further letters from the trade, especially from merchants who have had experience in this direction.

Letters from Hardware Merchants.

The letter given below is from a Hardwareman who has carried a stock of the supplies for several years and with satisfactory results. He furnishes a list of the items which he considers adequate for the merchant to carry:

FROM OHIO: The writer believes that it is possible for nearly every Hardware merchant advantageously to handle Automobile Accessories. In the first place, many of these accessories are a part of his regular stock, and it is but little trouble to assemble them, add a few necessary items, and advertise Automobile Accessories as a part of the stock.

Stock of Accessories Suggested by a Merchant with Two or Three Years' Experience in This Line.

We would suggest the following items, after having gone through two or three years of it, as a sufficient stock along these lines to be called a money-maker:

Automobile Jacks, one or two kinds.
Hard Oils in 1, 5 and 10 lb. packages.
Albany, or other grease, in different numbers.
Monogram or Valve Oils.
Cotton Waste.
Double and Single End Wrenches, 4 or 5 sizes.
6-in. Combination Pliers.
6 and 7 in. Side Cutting Pliers.
6, 8 and 10 in. Pipe Wrenches.
Ordinary Screw Wrenches.
Copperized Oil Cans.
Oil Guns for Hard Oils.
¼-in. Rubber Tubing.
Dry Batteries.
Hand Soaps in 1-lb. cans.
Linseed Oil Soaps in 5 and 10 lb. cans.
Solarine or United States Metal Polish.
Furniture Polish for bodies.
Small B. P. Hammers.
Assortment of Files.
Packing in small sizes.
Pumice Stone.
Auto Oil Stones.
Thermos Bottles.
Automobile Baskets, &c.

It is not necessary to carry all of these, but all of them are purchased here by local patrons and the transient trade as they stop going through town.

The following letters come from merchants in different parts of the country, who are inclined to question the wisdom of going into this line:

FROM GEORGIA: The writer is strongly inclined to believe that it will not pay any Hardware concern to under-

take to handle Automobiles. This is a line of business that takes up a great deal of time, and the adjustment, &c., to a machine which has to be made free after the sale is made, makes it unprofitable. The writer believes that Automobiles can only he handled satisfactorily as a separate business.

In regard to supplies, any town where many Automobiles are sold has garages that can take care of this business better than a Hardware store can. Of course there are a good many small tools, &c., which are used that can be handled to advantage through the Hardware trade.

FROM ARKANSAS: We have a number of Automobiles in this city, more than I ever expected to see, owing to the roughness of the country. It seems to me that no two machines are alike in this territory, and my opinion is that every man that owns an Automobile is agent for the company producing it. He gets a sample machine at an especially low price, agreeing to represent the company, of course.

FROM MINNESOTA: We have in the city several garages, the owners of which are agents for automobiles. As they are practical men in the business, do repairing, give instructions, &c., it never seemed to me that it would be a profitable line for me to handle, as I am neither a mechanic or an automobilist. None of the five Hardware firms do anything in that line here.

FROM MICHIGAN: From personal observation it seems to me it would be dangerous for a Hardware merchant to undertake to handle supplies and accessories for Automobiles. I have given this matter much attention and studied the advisability of stocking the parts most frequently demanded, but have not done so on the advice of those experienced in the matter as well as by the advice of the manufacturers themselves.

FROM OHIO: I know that some Hardwaremen are dipping into this branch of business, and are selling some machines. The Automobile business, however, is largely an outdoor line, and a good deal of time is required to make a sale and when the sale is made the Hardwareman is expected to know all about the idiosyncrasies of the machine and be able at a moment's notice to offer a remedy. To make the business as profitable as it should be, a shop is necessary and additional help is needed, and perhaps when the books are balanced the profit side will not loom up as expected. Outdoor work means neglect of indoor work, and one thing well done is better than two partially done. We have not tried to sell Automobiles because of the above point of view.

OWING to the material growth of its business during the past few years the Thayer Mfg. Company, Williamsburg, Mass., requiring all the time and attention of its principals at the plant, has turned over the selling end to the Smith & Hemenway Company, 108-110 Duane street, New York, which will handle this line through its selling organization. The Thayer Mfg. Company is well known as a manufacturer of small tools, its business dating back to 1840. The Smith & Hemenway Company, to which all inquiries concerning quotations, &c., should now be addressed, will carry a full line of the goods in stock and be prepared to fill all orders with promptness and dispatch.

THE firm of F. E. Kohler & Co., manufacturers of Hardware Specialties, Canton, Ohio, who have been doing business at the same location and without a change of partners since October 1, 1879, has been succeeded by the F. E. Kohler Company, which has just been incorporated. The business will be continued under the same management as heretofore. The officers of the new company are F. E. Kohler, president and treasurer; A. A. Oldham, vice-president and Camille Monnet, secretary.

OWING to the fact that Yankton, which was selected as the scene of the 1910 convention of the South Dakota Retail Hardware Association, has made no move toward the building of its projected auditorium, it has been decided as for the best interest of the association to hold the convention at Sioux Falls. This action was taken at a meeting of the Executive Committee of the organization held last week. The convention will take place during the third week of February, as already noted. As was the case last year there will be an exhibition of Hardware and related goods by manufacturers and jobbers, the details of which are now being worked out.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for our Catalogue Department and for notice in this column.

BERGER MFG. COMPANY, Canton, Ohio: Catalogue devoted to Adjustable Shanks and Circles and other accessories for Eaves Trough, Hangers, Hooks, Conductor Pipe Fasteners, Trough Ends and Drops, One-Piece Eaves Trough Miters, &c.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Catalogue No. 52, revised edition, which incorporates illustrations and descriptions of the company's line. This includes Single Shot Target and Sporting Rifles, Repeating Rifles, Single and Double Barrel Hammer and Hammerless Shotguns, Rifle Barrels and Specialties, Rifle and Pistol Sights, Cleaning Rods, Gun Grease, Gun Oil and Accessories.

AMERICAN TAP & DIE COMPANY, successor to Nichols Bros., Greenfield, Mass.: Catalogue of 116 pages illustrating its different lines. The first 40 pages show Nichols Bros. brand of Butchers' Tools and Cutlery, while 74 pages are taken up with Threading Tools, 17 of which show a line of Screw Plates in 49 different combinations.

O. M. EDWARDS COMPANY, Syracuse, N. Y.: Catalogue C showing a line of heavy bronze metal Pad Locks, which it has added to its already extensive line of Car Window Trimmings and Extension Platform Trap Doors. The Pad Locks are shown in 12 numbers, with and without chain, for railroad and railroad switch use, respectively.

JOHN CHATILLON & SONS, 85-93 Cliff street, New York: Catalogue entitled "Some Scales and Tools," devoted to wholesale market Scales, Cleavers, Beef Splitters and Butcher, Skinning, Sticking and Boning Knives.

INGRAM-RICHARDSON MFG. COMPANY, Beaver Falls, Pa.: Circulars relating to Enameled Iron Signs in a variety of forms and for numerous purposes, made in any size, color, shape or quantity from one up. Illustrations are given of a number, including agency signs, signs for streets, offices, hotels, factories, &c.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers catalogues, price-lists, quotations, &c.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM GAMBLE HARDWARE COMPANY, Wetumpka, Ala., which has recently bought the stocks of King Bros., Alexander City, Ala., and Spigner & Jones, Clanton, Ala. The company will do a jobbing and retail business in Shelf and Heavy Hardware, Stoves, Ranges, Mill Supplies, Farming Implements, Crockery, Paints, Oils and Glass at Alexander City and Clanton, as well as at its Wetumpka store.

FROM MOREHOUSE & WELLS COMPANY, Decatur, Ill., whose large six-story building was destroyed by fire on the 22d ult. The loss on the building and stock is estimated at $275,000, with insurance of nearly $200,000. The company has secured temporary quarters, and will use its warehouse on the railroad tracks as a nucleus in starting again. Later the company will rebuild on the old site, with which it has been identified for a period of 50 years.

IN connection with the shop work done by the students during the vacation period it is the practice of Sibley College, Cornell University, to give one hour's credit for every two hours devoted to actual work in a shop or foundry, provided the latter is approved by the faculty as a proper place for gaining useful experience. In the case of a few shops, however, notably the Yale & Towne Mfg. Company's plant at Stamford, Conn., double credit is given for any time thus spent as in the opinion of the faculty it is the full equivalent of the instruction given at the college.

Handling Small Rope.

AN ingenious arrangement for the orderly handling of small Rope from the reel to customers' hands is illustrated herewith, as used in store of John S. Menagh, Jersey City, N. J. On one of the upper floors are uprights between which are 10 wooden reels containing small Rope. Rods ½ in. in diameter with long threads on each end are run through the uprights and reels, and lock nuts are screwed up against washers on each end of the reels to hold the reels in place. Ratchets and dogs, similar to those used on some makes of garden hose reels, are attached to Rope reels, and have a spring against the dog to keep the reel from unwinding too rapidly. The Rope rack stands about a foot from the stairway, so that the Rope from each reel can be started down stairs over a pulley. The Ropes are then carried diagonally down through three sets of screw eyes on the inside of the stairway partition, following the pitch of the stairs, and brought into the salesroom through the stairway partitions. For this purpose 10 sash pulleys are set perpendicularly in the partition and the Ropes run through the lower opening in the pulleys, about 6 ft above the floor. The distance taken up by the 10 pulleys is 16 in. in width. The longest Ropes seen in Fig. 5 are those brought down from the reels. Between each of these is a sample of the Rope to the left, stapled to the partition. The Rope handled in this manner includes Cotton, No. 3 to 5-16 in.; No. 8 Braided Clothes Line, ¼ in. and 5-16 in Manila Clothes Line and ¼-in. Jute Clothes Line. Above each sample of Rope the kind and size is marked as follows:

1c, 2c, 3c, No. 8 Sash, 1-4 Jute, 3-16c, 7-32c, 1-4c, 1-4m., 5-16m.

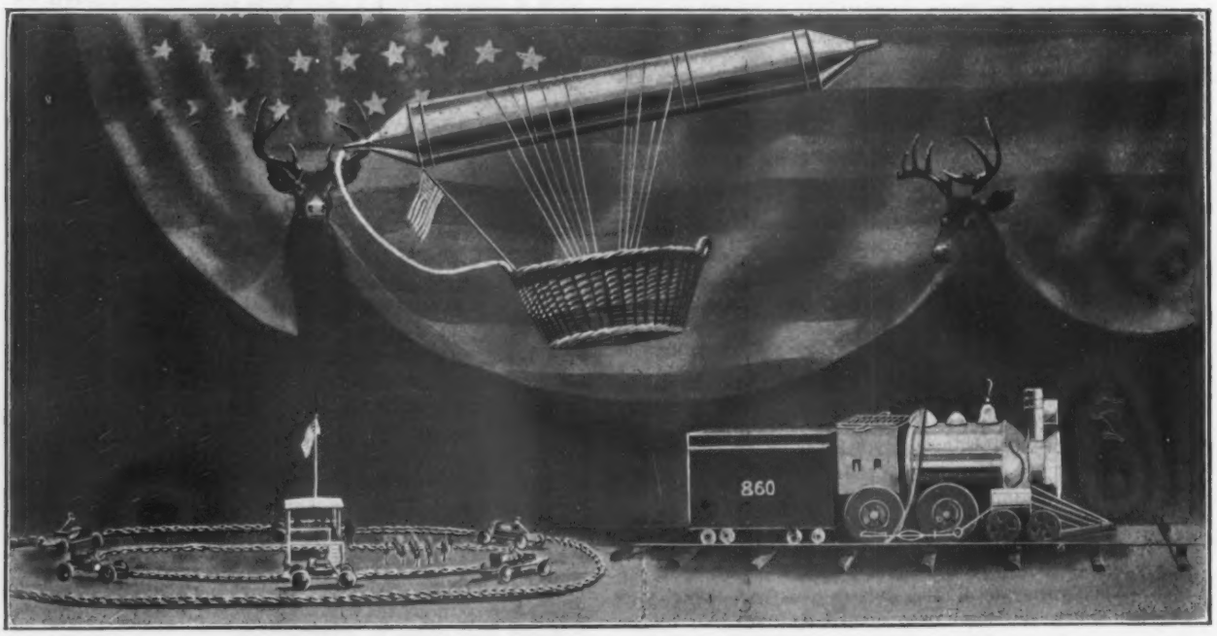
The letter c signifies cotton and m Manila. A card price-list is tacked to the partition at the left. Rope ⅝ to 1½ in. diameter is kept in the cellar.

Arrangement for Handling Small Rope, Conducted from an Upper Floor and Brought Into Salesroom Through Stairway Partition, Running Over Sash Pulleys.

Elks' Carnival Week Window Display.

Airship, Automobile Race and Locomotive Combined.

THE window display shown herewith included an automobile race, locomotive and airship, the background being a large American flag draped over elk heads in honor of the Elks' carnival week, recently held in North Tonawanda, N. Y. The display was arranged by the Knapp-Cramer Hardware Company of that place, with mounted samples of Builders' Hardware for background to the automobile race, which are not shown in the illustration. There was also an Alarm Clock under each elk's head with the hands pointing to 11 o'clock.



A Window Display Prepared for the Elks' Carnival Week by the Knapp-Cramer Hardware Company, North Tonawanda, N. Y.

The floor of the window was covered with green cloth to resemble turf. Pump Chain answered for a fence, and sawdust was sprinkled on the race track. The racing automobiles were each made with two pair of Door Knobs for wheels, with Escutcheon Plate laid on for the body, a Box Strike for seat and a Brass Key for steering wheel.

Sand was used for the roadbed of the railroad. The rails were Barn Door Track laid on Hammer Handles for ties. The driving wheels of the locomotive were Emery Wheels, a 5-gal. Milk Can served for boiler, an Egg Beater for cylinder and Folding Rules for cowcatcher. The headlight was a Biscuit Cutter, and a Bell and Oilers on the top of the boiler represented bell, whistle and sand box. A Bread Box was used for a tender, set on Biscuit Cutters for wheels. Back of the bell and sand box was a card reading "keep smiling."

The airship was made of three joints of 8-in. Tin Furnace Pipe with a Tin Funnel at each end. A willow Clothes Basket was suspended by cotton lines, and a piece of white Rubber Tubing was used as connections between the ship and the Basket. A small flag floated from the stern. The arrangement of the window was comparatively simple, but it attracted much attention and was most favorably commented upon.

Not in the clamor of the crowded street,
Not in the shouts and plaudits of the throng,
But in ourselves are triumph and defeat.
—*Longfellow.*

Modern Merchandising.

BY ON-THE-ROAD.

THE story here related contrasts past and present methods of merchandising and the part played by them in success or failure. The localities are in prosperous sections of a great State. A Hardware business that had depreciated for various reasons was taken over by a man who for some years had represented on the road a prominent wholesale house, trading largely in Southern territory. The goods hidden away in boxes and packages on shelves and under counters, some for a long period, were overhauled, dusted, cleaned up and placed in uniform receptacles, of which a large number were required, baskets or Dripping Pans serving equally well.

Displaying and Pricing.

Each kind and size with one large price card for each group had its own place and all were conveniently displayed on regular and improvised counters covering the available floor space, leaving only aisle room for the salespeople and customers. There was some snappy advertising in the local press and otherwise. Stock deficiencies were made up and new lines taken on so as to make the store appeal to the educated taste, and in five months a cash business of $20,000 was transacted.

Another Slow Stock Profitably Moved.

In the meantime, another property in the same general condition was acquired many miles away. Two weeks were consumed in digging out hidden treasures, in the main salable and good but previously lost sight of, unseen and unsung. Similar procedure was followed as to display, the interior floor space being utilized to the limit; both show windows attractively arranged, and the commodious sidewalk partly covered with Garden Implements, Screens and Doors, Netting and kindred goods.

Sweetening the Stock.

Here also lines of goods were added in housefurnishings not hitherto on sale and on the front of the building in plain lettering, large enough to be seen several blocks, was displayed a banner calling attention to a large stock to be sold in 30 days at low prices. The location was not a good one for attracting a crowd, being in a measure away from the tide of travel but the vigor with which the campaign was pushed and the shrewd methods of effectively displaying large assortments of goods for daily use created a demand that had not previously existed.

Getting Customers in Touch with the Goods.

The key to the whole venture was prominent display, prices in plain figures, accessibility of goods so people could stroll through the store and not only see but handle, and so assorting the stock by discreet buying that large numbers were served. The goods practically sold themselves, the time of the employees in great measure being required in taking orders, handling money, wrapping and delivering goods.

Results.

In six weeks $6,000 in cash was taken in a business that had been allowed to dwindle to about $10 or $15 a day cash. Under the new régime as much as $500 a day has been done, the only book charges being to some well-to-do customers having estates nearby and for 30-day settlements. Anything not entirely satisfactory was taken back and money refunded without discussion or quibble. This method of satisfying often proved to be but a prelude to large purchases on the part of the pleased customer.

Too Much Introduction.

In all my experience of selling to the trade I have found but few that were not ready to say "No" as soon as I introduced myself. I think that the less introducing a salesman does with himself the better success he will have. I believe in getting busy as soon as I can get the dealer's attention and drive away at my proposition. The dealer knows that his store is the most up-to-date and that his town is the most prosperous west of Chicago. What a salesman wants to do is to sell goods and not be a booster for a Promotion Committee.

Get Busy at Once.

I have always found the plan of having something new a good idea. In handling the —— line most every dealer, when I told him that I had something new, would say that he knew the contents of the line, but when I would draw out a new sample from my pocket and get him interested it would give me an opening for the balance of the line. When he had seen the entire line he would say with surprise that he always thought that it consisted of the $1 and $1.50 goods. It goes to show that half the dealers think they know more about a line than the salesman who is handling it, and unless a salesman uses tact he will get turned down in most cases, and will be unable to present the dealer the full value of his line.—*Letter from a Traveling Salesman.*

Stimulating Interest.

The Day's Work.

When we have done a good day's work we are satisfied and at peace with the world and ourselves, no matter how tired we may be; but when we have shirked we are ill at ease. Even if we promise ourselves that we will do better to-morrow, we are still troubled. Why? Because somewhere deep down in our hearts we know that we have lost a part of the day—let run to waste some of the stream of gold—and, of course, that is forever gone. When we have so worked that we can go to our resting places at night with a feeling that we have done not only enough to escape censure from our superiors in office, but that we have done an honest day's work at our appointed tasks, and that we have besides made good use of our spare moments in learning something which shall advance us, we gain trebly. We gain the immediate profit, the future profit and the better strength for to-morrow.—*J. E. Clark.*

Heart Tells the Story.

Success.

No man can explain the secret of his success. It is part ability, part ambition, part environment and part opportunity. Mass the component parts into a whole, embrace the opportunity the very moment it dawns upon you, and you cannot fail.—*L. F. Loree.*

CHARLES A. HOTCHKISS, Bridgeport, Conn., died August 14, at his home in that city. He was for many years connected with the Hotchkiss Sons Mfg. Company, but for the past few years had not taken an active part in business affairs. Mr. Hotchkiss was born at Sharon, Conn., in 1836, and leaves a widow, one son and a daughter.

THE CUTLER HARDWARE COMPANY, Waterloo, Iowa, is breaking ground for a new fireproof building of reinforced concrete and steel construction, four stories and basement, which will cost approximately $40,000. The company will use the building for wholesale exclusively, and expects to have it ready for occupancy in February, 1910.

Correspondence.

Hardware Merchants' Opportunities in the Sale of Goods.

To the Editor: I have read the editorial in your issue of the 19th ult. with a great deal of interest. There is no question that the retail dealer and the jobber of to-day must keep in touch with all new goods and new conditions, if they desire to have the fullest measure of success.

This is particularly true of the Screen business at the present time. During the past two years there has been a campaign of education going on throughout the country. Scientists, entomologists and physicians have all been discussing the common house fly, and calling attention to the fact that the fly and mosquito carry filth and disease wherever they go. Hundreds of articles and editorials have been written on this subject.

This agitation will make quite an impression on the public in general. It therefore behooves every jobber and retail Hardware dealer to take advantage of this particular situation which has been created by outside interests. It seems strange that any householder would put up with the inconvenience and the annoyance, to say nothing of the danger of disease, from flies and mosquitoes, and yet there are hundreds of houses that have never been screened. In this age of the low priced Adjustable Window Screen and stock Screen Door, there is really no reason why every house should not be completely screened. It is practically up to the retail dealer to be alive to the situation and take advantage of this campaign of education, and advertise these goods thoroughly in his local papers and thus largely increase his business in this line.

The trouble with a great many dealers in buying seasonable articles is that they simply refer to their records of the previous season and buy practically the same quantity for the next season, not taking into account changed conditions. Then when the season is at its hight they sell out the goods they have bought and fear to buy additional goods, thus losing a large share of the business that they might otherwise secure.

The writer is interested in the sale of screen goods, but this makes no difference, as every manufacturer, every jobber and every retail dealer handling screens should profit by the campaign of education that is now being carried on throughout our country.

To show to what extent the matter has engaged the attention of physicians, a party in conversation with a physician at a state convention of physicians and surgeons asked the question: "Why do you meet in summer when the weather is so uncomfortable? Why don't you hold the convention in winter or in the cool of the autumn?" "Quite simple," was the reply. "May and June are the physicians' slack months. In cold weather people shut themselves up in hot stuffy rooms and so many of them get sick of lung troubles and other related ailments that it keeps us doctors busy, and in the late summer, after the flies get plentiful, they infect people with typhoid, diarrhoea, summer complaints and such things, and we are hard driven until the frost kills the flies."

Now the Hardware jobbers and retail dealers have usually considered the screen season as running from April 1, to July 1, and on the latter date immediately think it is necessary to close out their stock. Yet from the testimony of this physician, the worst season of the year for flies is during late summer, that is from July 1 until the middle of September—in fact screens should be placed in the windows early in the summer season and kept there until snow flies.

MANUFACTURER.

The Poe Hardware & Supply Company, composed of N. C. Poe and N. C. Poe, Jr., has purchased the interest of William Wilkins in the firm of Wilkins, Poe & Co., Greenville, S. C., which has been dissolved.

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Tennessee Retail Hardware Association.

THE second annual convention of the Tennessee Retail Hardware Association was held at the Hotel Patten, Chattanooga, on the 19th and 20th ult. A good proportion of the membership was in attendance, supplemented by a number of representatives of well-known jobbing and manufacturing concerns. The Hon. H. Clay Evans, representing the Chamber of Commerce, felicitously welcomed the convention to Chattanooga.

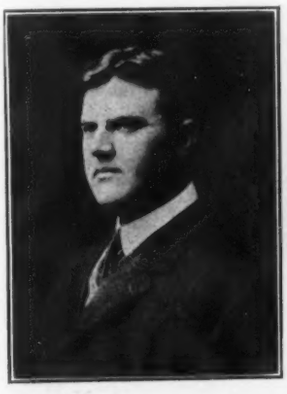
Convention Committees.

President Dobbins appointed the following committees to serve during the convention:

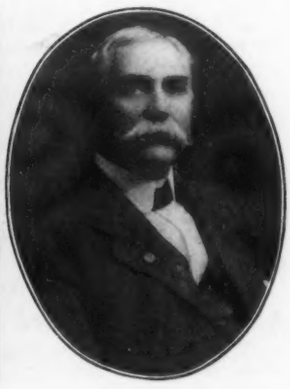
RESOLUTIONS: W. V. Hager, Robert Bullock, W. T. Marshall.
AUDITING: A. B. McGill, E. S. Clayton.
PRESS: M. Richardson.

Secretary Richardson's Report.

In his report as secretary, M. Richardson, Lawrenceburg, stated that while the membership had increased somewhat during the past year, there were still a large



M. RICHARDSON.



JOHN D. DOBBINS.

number of merchants who were not affiliated with the association. There seemed to be too much apathy, and merchants failed to realize what might be accomplished by a strong organization. The Hardware merchants of Tennessee numbered more than 300, and the secretary believed that the association should have at least 75 per cent. of them to make the organization effective. He desired to impress on the members the necessity of cooperating with the officers in explaining the objects and benefits of the association to their nonaffiliated brethren.

National Vice-President's Address.

H. L. McNamara, Janesville, Wis., first vice-president of the National Retail Hardware Association, made an able and interesting address, in which he brought greetings from the national body. He said that the first great consideration with the national organization was the welfare of the State associations, and congratulated the Tennessee merchants on the earnestness shown in their work as evidenced by the fact that they were willing to sacrifice personal comfort to discuss business problems during the heated season of the year.

Mr. McNamara also touched on the subject of parcel post, which he said was a vital question to the small retail merchants throughout the country, and urged that the members be alive to the danger of such legislation both as citizens and merchants, and see to it that the national lawmakers are not deceived by the representations made in the interest of the catalogue and mail order houses.

Referring to the part that business organizations should take in public affairs, Mr. McNamara concluded as follows:

> The discussion of this question naturally leads up to the broader subject of what part should a business organization such as your State organization take in public affairs. To my notions it is one of the very reasons for being organized. The present century is an age of commercialism. Our great country has developed by leaps and bounds, and the fortunes that have been made in this country in the last two decades, together with the power which accumulated wealth yields, are enormous. They surpass all understanding and comprehension.
>
> **The Scramble After Wealth and Business Success**
>
> is unprecedented and the great questions that confront our law-makers to-day, both in the several States and in Congress, are questions relating to commercial relations. The question of political rights was decided many years ago, and the great orations and speeches of to-day are devoted entirely to certain phases of our commercial life, the existing evils and remedies for bettering existing conditions. Every one of us is interested in such matters, and our individual interests are identical. We must watch these interests at all times and fight honorably and openly to maintain our just rights. By organization we can make an effective fight, but let that fight always be honorable and upright. Let your organization be known as the best in the State for honesty of purpose and square dealing.
>
> **The Merchant's Duty.**
>
> There is an old saying that no chain is stronger than its weakest link, and this applied to an organization means that the whole can be no better than its individual members. Therefore, it is the duty of every member having the good of his State organization at heart to conduct himself in his community with that sole end and aim in view. Let us prove to the world that Hardware merchants are honest, energetic, capable, and that we are good citizens in all that the word implies. Then, indeed, will our associations become agencies for ennobling the characters of their members and the world the better because of their existence.

Talks by Traveling Salesmen.

At the Thursday afternoon session a number of interesting and stimulating talks by traveling salesmen who are honorary members of the association were made. The speakers included H. M. Owsley, Norvell-Shapleigh Hardware Company, St. Louis; William B. Gill, Simmons Hardware Company, St. Louis; Fred Martin, Gray & Dudley Hardware Company, Nashville, and Alex. Fall, J. H. Fall & Co., Nashville.

Election of Officers and Committees.

The following officers and committees were elected for the ensuing term:

PRESIDENT, W. V. Hager, Hartsville.
FIRST VICE-PRESIDENT, J. W. Bayless, Athens.
SECOND VICE-PRESIDENT, A. B. McGill, Shelbyville.
SECRETARY-TREASURER, M. Richardson, Lawrenceburg.
EXECUTIVE COMMITTEE, W. V. Hager, Hartsville; J. M. Bennett, Cleveland; W. T. Marshall, Lebanon; M. A. Walker, Covington, and L. D. Love, Nashville.
GRIEVANCE, J. T. Mitchell, Columbia; A. M. Sherman, Athens; William Tucker, Jr., Ripley.

Place of Next Convention Not Decided.

The strong rivalry between Nashville and Knoxville for the privilege of holding the next convention resulted in a tie vote. After several ballots a resolution was adopted leaving the determination of the time and place of the next convention to the Executive Committee, decision to be rendered by January 1.

North & Judd Mfg. Company's New Catalogue.

THE North & Judd Mfg. Company, New Britain, Conn., has just issued catalogue No. 82, bound in stiff covers, containing 539 pages, devoted to the Anchor Brand of Harness, Baggage, Belt and Blanket Hardware. Each article is illustrated with a number, name and pattern. The sizes, prices, finishes and quantity in a package are also given in connection with the illustrations, thus furnishing abundant information at a glance. An alphabetically arranged index and a department index make ready reference easy. In addition to these is a cut out marginal index so that any of the sixteen departments can be quickly turned to.

The J. H. Collier Hardware Company has been incorporated with a capital of $10,000 in Newton, Mass. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Window Glass, Paints, Oils, Sporting Goods, Lime, Cement, Doors and Sash.

Electric Welding in Steel Goods.

MANY interesting developments have been made in the past two years in the application of point contact electric welding. Its successful use in the fabrication of trolley poles, structural steel, &c., where recent tests have shown it to pass every requirement imposed by the Government engineers, demonstrates conclusively its ability to withstand severe strain. We may expect, therefore, to see it constantly widen its field of usefulness in the manufacture of goods handled by the Hardware trade. We must not be surprised to see it take the place of much of the riveting, forging, brazing, fire-welding and perhaps other processes that have become familiar to us as the accepted methods of manufacture.

A great deal of progress along these lines has been made by the American Fork & Hoe Company, whose executive offices are at Cleveland, Ohio. With a promptness that is commendable, this company very early took up the possible application of point welding in the manufacture of its line, and has studied and experimented in a pioneering way and at great expense for many months. While its experiments are by no means at an end, the company has already accomplished much, and has put entirely beyond the experimental stage a number of different ways in which point welding is now being employed in its factories with very great success. So far, some 10 or 15 patents have been granted to the company covering the machines and processes perfected to date.

Welding Teeth to the Head in Garden Rakes.

One of the company's earliest successes was an electrically welded Rake to supersede the old malleable Garden Rake. It was able, by welding the teeth to the head, to offer the trade not only a steel Rake of greater strength, but also much neater in appearance, without increasing the price to dealer or consumer one cent. Since that time it has applied the process to the manufacture of the better grade Garden Rakes, so that now the highest priced Rakes, as well as the lowest priced, have electrically welded teeth. In each instance it means a greatly improved tool with no increase in cost to the consumer.

Tines on Coke Forks, Stone Forks, &c.

More recent still is the welding of the tines on heavy Forks, such as Coke Forks, Stone Forks, &c. Of course, when it is known that electric welding stands the strains imposed upon structural steel, it seems a very logical thing to apply it to the attaching of tines to a Stone Fork. But to accomplish the necessary results was by no means as simple a matter in fact as in theory, and it is only within the last few months that the work of the company has been pronounced a complete success.

Welding, in the case of the Forks, takes the place of rolling; in the case of the Rakes, it takes the place of forging by hammer. In both cases under the old method, solid bars of steel are press forged and cut to shapes forming the head of the tool with projecting knobs to be drawn out into the tines and the teeth—the tines of the Fork being drawn by skillfully passing them through rolls of varying sizes; the teeth of the Rake being hammer forged to the desired size. By either process it has been impossible to obtain an absolutely uniform weight of forging—not nearly so uniform as can now be obtained by first forging the tines or the teeth and then electrically welding them to the head.

Strength and Appearance Served.

Further than this, electric welding makes a stronger tool at the joining point, as there is a greater weight of metal. It also means a better appearing tool. As strength and appearance are two of the most important points which the farmer or gardener demands in his tools, it can be seen that electric welding has an important part to play in the manufacture of steel goods from the point of view of the consumer and merchant, as well as the manufacturer, for it accomplishes its improvement in the product without materially increasing the cost of production.

Joining Ferrules and D Tops.

Besides the changes in Rakes and Forks just mentioned, the company has for some months been using electric welding for the joining of Ferrules instead of brazing. Again it obtains greater strength and a better appearance. The brazed Ferrule always showed a bad seam, scaled badly and was otherwise undesirable for use in assembling a high grade, neat appearing tool. D Tops are now also being joined by electric welding and are much smoother and stronger than formerly.

Welding in Hoes.

The company has also found it advantageous to make an important change by the aid of welding in the Hoes formerly known as "riveted sheet steel Hoes." This type of Hoe formerly consisted of shank and shield riveted to the plate, the shank and shield being of malleable iron. In place of the malleable iron the company now uses steel, and in place of the riveting, the shield is welded to the plate. It makes a very much stronger shank and the shield is much neater, fitting closer to the plate.

Progress and Improvement the Motto.

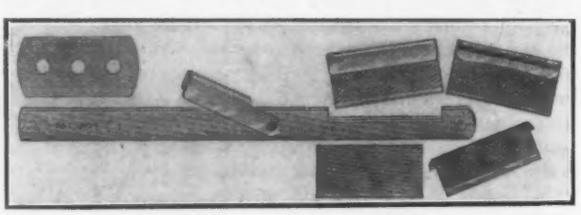
With these and other improvements already accomplished, and with many more in an experimental stage, it can readily be seen that the manufacture of steel goods is somewhat in a state of evolution, from the seemingly perfect and highly specialized processes, to a step beyond anything we had reason to expect. Farm and Garden Hand Tools, as they have been made by the American Fork & Hoe Company, are among the most honest and worthy merchandise that reaches the merchant's stock. There have been so many improvements in manufacturing processes, and in the perfection of the product from the consumer's point of view made by this company in recent years (entirely without demand from the trade and simply through its own desire for progress and improvement), that we had come to consider the line as capable of no further betterment. It has therefore been with more than usual interest that we have watched the research work of the company in the interesting field of electric welding.

A. S. M. E. Standard Taps, Dies and Screw Plates.

The Wells Brothers Company, Greenfield, Mass., is making a line of taps, dies and screw plates in the American Society of Mechanical Engineers' standard. The company explains that in the past there has been no acknowledged standard of sizes on machine screw taps, each manufacturer of screws having a standard of his own, as well as each manufacturer of taps and dies. The result has been that a large number of different standards, so called, were in use. The standard now adopted, known as the A. S. M. E., is made to conform in a great many ways to the United States standard, having an included angle of the thread of 60 degrees, with flat top and bottom of the thread for the basis standard of one-eighth of the pitch. The company is packing six different assortments in neat wooden cases, including stock, taps, dies, collets and adjustable tap wrench, of A. S. M. E. standard sizes and pitches.

The Improved King of All Stropper.

The improvement recently made by the King of All Stropper Company, 161 Summer street, Boston, Mass., in its stropper consists of an arrangement whereby all



The Improved King of All Stropper.

safety razor blades may be honed or resharpened. The device as now made permits the stropping of both edges of a double blade without taking it out of the frame, as both edges are exposed. It is pointed out that this eliminates the danger of cutting the fingers or of making one

edge dull while sharpening the other. The illustration shows the right hand end as designed to hold the Ever Ready, Gem, Junior, and all double and single thin edge safety razor blades. The left hand end is for holding Gillette blades. The feature of honing and stropping is especially emphasized by the manufacturers.

Richards No-Break Sliding Door Lock, No. 500.

A late addition to the expanding line of hardware specialties made by the Richards Mfg. Company, Aurora, Ill., is the sliding door lock here illustrated. Its working parts are described as few and simple and with positive action. Extra strong jaws are provided to guard against breakage and the locking mechanism is so designed that only one tumbler is required. Each lock is supplied with a different key and the lock is reversible—that is, it can be used on either side of the door and can be locked or latched from either side. An important feature of the lock is that in bringing sliding doors together the lock receives and grips the holding lug through an opening in its side, so that the door and not the lock sustains the impact when the door strikes the jam. The lock presents an entirely smooth surface, with no projections to catch or tear the clothes. As will be noted in Fig. 2, the hand hold covers, which operate from both inside and outside, serve as flush pulls as well as to operate the lock. The point is emphasized that the act of pressing back the flush pulls to open the door unlatches the lock. While exceedingly simple, the lock is referred to as fool proof and one which cannot be easily tampered with or picked. They are suitable for doors 1⅝ to 2¼ in. thick and are made in one size, 4½ x 6¾ in., with a regular dead black finish, although special finishes are made upon order. The locks are packed one each in a pasteboard box, complete with all screws and two keys, with directions for applying. The shipping weight is 65 lb. per dozen.

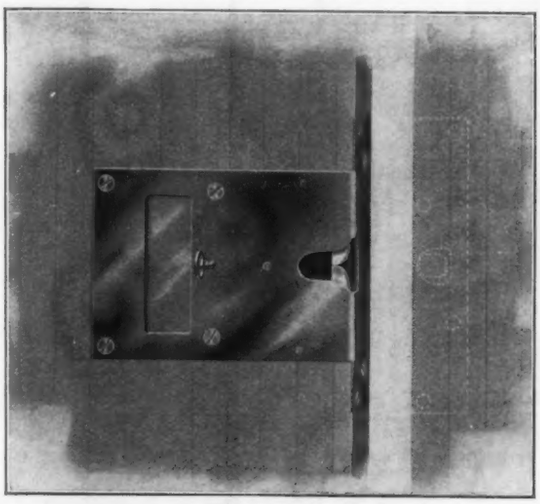


Fig. 1.—Richards No-Break Sliding Door Lock No. 500, Which Can Be Used on Either Side of the Door and Can Be Locked or Latched from Either Side.

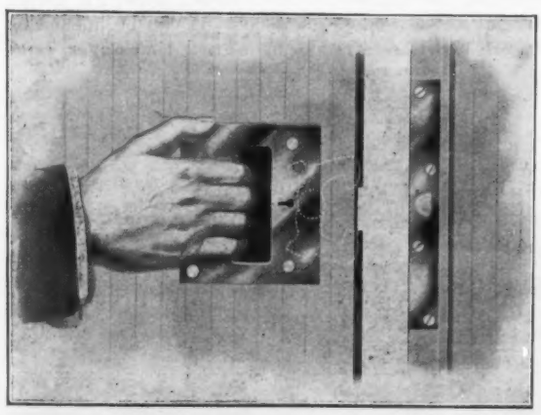


Fig. 2.—The Hand Hold Covers Operate from Both Outside and Inside and Serve as Flush Pulls as Well as Operating the Lock.

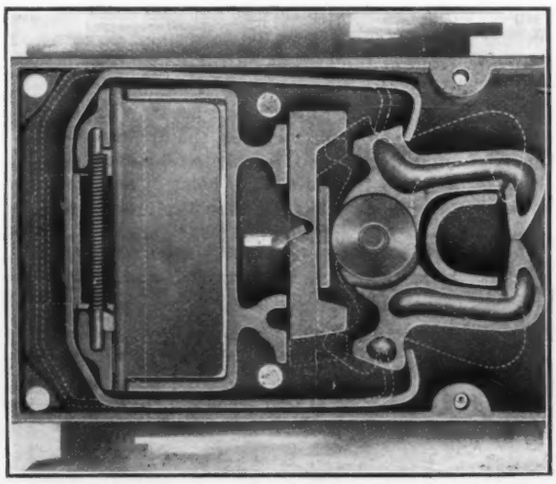


Fig. 3.—Working Parts of the No-break Lock. Locking Mechanism so Simple That Only One Tumbler Is Required.

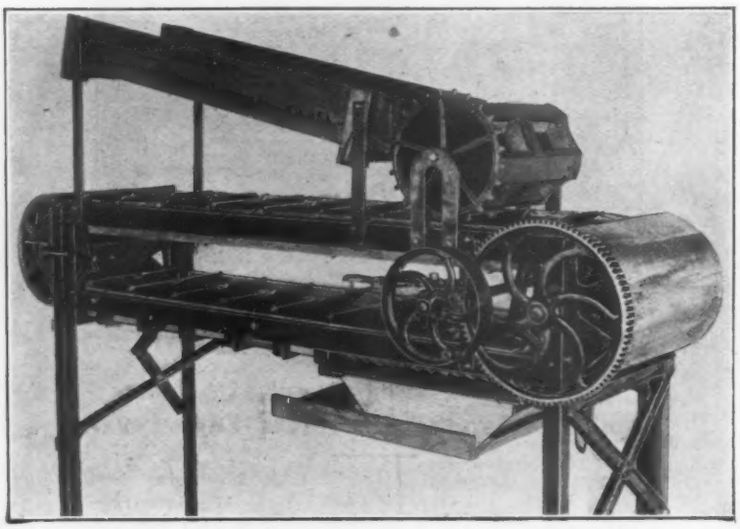
Leonhart's Improved Straight Edge Level.

Since the Leonhart straight edge level was first brought to the attention of the extreme Western trade a little more than two years ago, some decided improvements have been made in its construction, rendering it much more convenient and satisfactory for use. The frame is now stamped in one solid piece of steel and is provided at top and bottom with slots through which pass the screws for attaching the level to the straight edge. The slots in the frame of the level admit of ready adjustment and are a feature to which the maker calls special attention. The arrangement is such that the level can readily be removed from the straight edge without the necessity of taking out the screws, thus permitting of its being kept when not in use in the carpenter's tool chest without inconvenience. The glass constituting the level proper projects slightly from the frame, where it is in plain view. The device can be set to give any grade desired, and for setting window frames, door jambs, leveling joist, wall plates, &c., and plumbing walls and partitions, will be found of special value. There are no nuts which might work loose, nor threads to wear out, and the level can be attached to any piece of wood. Its actual size is 3 in. in diameter, and it therefore occupies such small space that it can be readily carried in the vest pocket if necessary. The level is offered by the Leonhart Level Company, San Anselmo, Cal., with New York office at 103 Park avenue.

Leonhart's Improved Straight Edge Level, Which Can Be Detached from Straight Edge Without Taking Out the Screws.

The Rapid Apple Slicer.

The apple slicer shown herewith is so arranged that the apples drop from the bleacher into the chute at the top of the machine and are sorted into small groups and deposited in front of the sweeps on the upper floor by the revolving drum, which has pockets. Passing to the rear of the slicer and carried to the lower floor by the sweeps which are attached to endless chains, the apples are automatically righted and sliced into rings. The frame of the machine is of angle iron, all parts being strongly made and interchangeable. Crated the machine measures 7 ft. by 4½ ft. by 2 ft. 10 in., weighing 625 lb. The slicer is



The Rapid Apple Slicer.

manufactured by the Goodell Company, Antrim, N. H. New York office, 10 Warren street.

The Steel Flyer.

The runners of the sled shown herewith are made from heavy sheet steel in such a manner as to form the shoe, or lower edge, with a smooth rounding surface, to make a strong and fast racer. The knees, or braces, are made from high carbon steel. The seat board is hard-

The Steel Flyer with Runners Made of Heavy Sheet Steel.

wood, mahogany finish, hand decorated. The metal parts are finished in hard baked black enamel, to give a beautiful and durable finish. The sled is made by the Turner & Thomas Company, Chicago, Ill., in four sizes, from 11 x 30½ in., 5½ in. high, to 13½ x 42½ in., 7½ in. high. The largest size is of special design and has raised center seat board, sloping sides with round hand rails 2 in. below the seat board.

Barney & Berry's Skates.

For the fall and winter trade Barney & Berry, Springfield, Mass., are calling special attention to key clamp fastened skates; ankle support skates and detachable supports, to be applied to any kind of lever skate; Canadian hockey and safety edge hockey skates and skating shoes, with or without skates attached. The shoes are made especially for Barney & Berry, of selected kangaroo calf upper, oak soles, full heel, Goodyear welt (hand sewed process). The lacing extends to the toe, to insure free action, comfort to the toes and ball of the foot, at the same time holding the instep and ankle firmly without binding. The tongue and toe piece are heavily padded to prevent the lacing from cutting the foot. There is a supporting strap around the ankle. The woman's shoe is just like the men's, except that the latter is two inches higher.

Covert's Fancy Dog Chains.

Covert's Saddlery Works, Interlaken, N. Y., is offering the dog chains shown herewith. The No. 854 is made of nickel plated safety chain, with finger rings on one end.

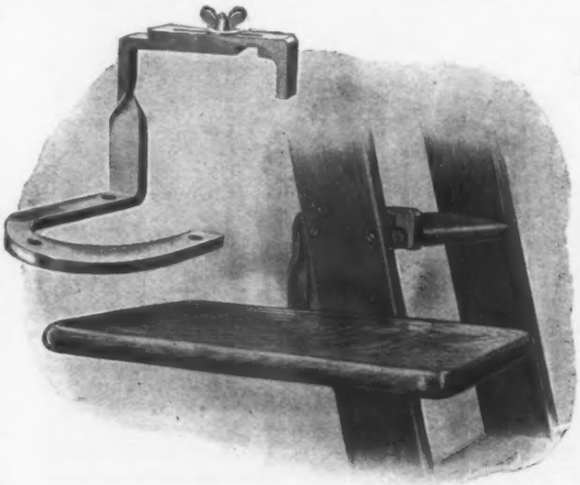
No. 854. No. 855.

Covert's Fancy Dog Chain with Finger Ring and Toggle Ends.

No. 855 is made of double iron jack chain, nickel plated, with toggle end. No. 853 is the same as No. 855, except that it is of plain double iron jack chain. All the chains have the firm's Triumph swivel snap on one end.

The Putnam Rolling Ladder Adjustable Shelf.

In connection with the manufacture of rolling store stepladders Putnam & Co., 244 Water Street, New York, are offering the adjustable shelf shown herewith, giving additional space for holding goods. It can be hooked on any shelf, and is referred to as a great time saver, espe-



The Putnam Rolling Ladder Adjustable Shelf.

cially when stock is being arranged in shelving. The metal parts are made of wrought iron, enameled black. The shelf is made of oak, to match the ladders, and measures 10 x 14 in.

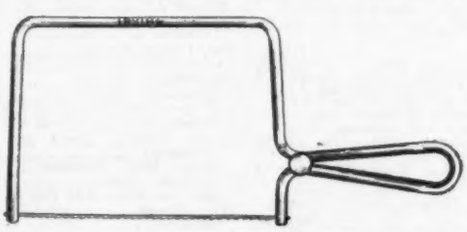
Kitchen Utensil and Automobile Steel Mats.

The Cary Mfg. Company, 19-21 Roosevelt street, New York, has added to its line of steel mats Cary's Everlasting automobile and kitchen utensil steel mats, the latter adaptation being illustrated. The mats for kitchen use numbered 20, 21 and 22 are respectively 7 x 8, 9 x 10 and 11 x 12 in., all ⅜ in. high, and are particularly serviceable for holding hot pots, kettles, pans, &c., fresh from the fire, thus protecting table and other surfaces from heat and soil. The rings reinforced on outer half of edges with an extra half ring constitute a strengthening selvedge where the size of mat makes it advisable, all the rings in all mats being 1¾ in. in diameter, made of 17 gauge cold rolled steel, ⅜ in. high and electro-galvanized to make rustproof and produce an attractive finish. Each line of rings is stiffened by two wire rods of 12 gauge, clinched at each end. This method of construction insures an air space for hot articles and an excellent scraping surface in the other forms of mats. The automobile mat just out embodies the same features, but is adapted in shape for automobiles. These are designated by the letters A, B and C, in sizes 9 x 18, 7¼ x 16 and 5⅜ x 14 in., respectively, and sold in pairs for automobile running boards. A simple device is furnished gratis to hinge the inner side of mat to body of vehicle above the usual rubber mat, so that it may be raised at right angles for washing or brushing off the mud and dirt scraped off in all directions when getting into the car. Greater holding power is also afforded as the rings are always on edge. This style of mat may be obtained in special lengths in any multiple of 2 in. in any of the named widths. Patents have been allowed for the United States and foreign countries.

Cary Kitchen Utensil Cold Rolled Steel Mat.

The Irving Coping Saw Frame No. 157.

The feature of the coping saw frame shown herewith is a thumb nut for holding the handles solid, this being a help in using the frame, as it can be held firmly in the hand. It is referred to as an improvement over wood handled frames. The frames are packed ½ dozen in a box, each frame having a blade in it and accompanied by 1 dozen blades in a separate envelope. The saw frames are put on the market by the Irving Mfg. & Tool Company, 157 Chambers street, New York.



The Irving Coping Saw Frame, with Thumb Nut for Holding the Handles Solid.

The Frameless Insect Screen.

The Frameless Screen Company, 5116 Springfield avenue, Philadelphia, Pa., is offering the screens shown in the accompanying illustrations. The screens are supplied in wire or of any textile of suitable mesh, from common mosquito netting to lace, made to fit window frames of standard dimensions. The eyelets are shown in Fig. 2, full size, and are secured in the border of the screen by means of tongues, which are bent over and engage with a disk, thus binding the screening material within the recess in the eyelet. Lock pins, also shown in Fig. 2, are tacked on the window frame inside the room. The pins have a revolving eccentric locking and unlocking device by which the screening material is stretched as in a frame and locked at any point. The dotted vertical line in Fig. 2 indicates the stretch of the screening material when the locking wing of the lock pin is turned from right—as in the upper view—to left, as in the lower view. When the wing is turned back the eyelet is unlocked and the screen wire disengages itself, as shown at the lower part of Fig. 1. A corner of a window frame with screen locked in place is shown in Fig. 3. It is explained that the lock pins are practically invisible, and that when the screen is taken down for winter the pins need not be removed. If either sash requires opening or closing the screening can be loosened as in Fig. 1, or entirely removed for washing windows or for other purposes. The company is considering the feasibility of supplying hardware merchants with a hand tool rig, the eyelets and lock pins, so that they can make frameless screens to order. The company states that with the outfit a man and a helper could make about 100 screens in 10 hr.

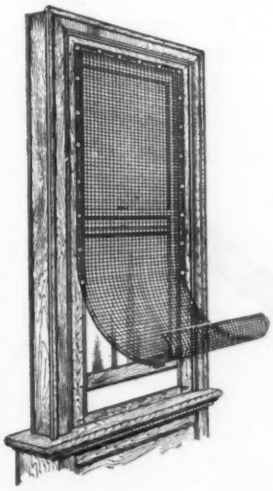


Fig. 1.—The Frameless Insect Screen.

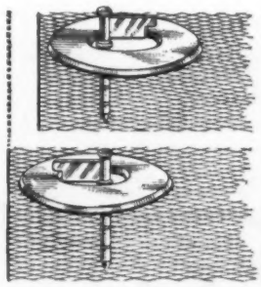


Fig. 2.—Eyelets and Lock Pins for Holding the Screening Material in Place.

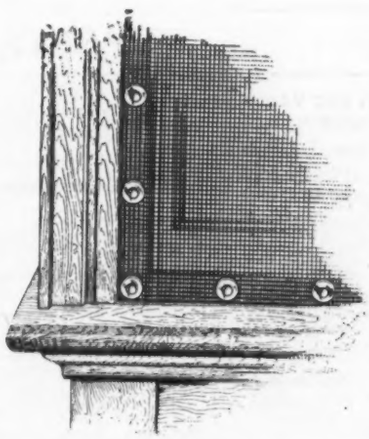


Fig. 3.—Corner of a Window with Frameless Insect Screen.

The Norcross Improved Hand Garden Cultivator.

C. S. Norcross & Sons, Bushnell, Ill., have made an important improvement in their hand garden cultivator in the way of a detachable handle socket, so that the tool may be used either as a hand cultivator or in a moment's time the socket, with handle, can be removed, as shown in Fig. 2, and the cultivator attached to a number of the

Fig. 1.—The Norcross Hand Garden Cultivator with Detachable Handle Socket.

standard wheel plows on the market. For use on double wheel plows two of the cultivators may be attached and both sides of rows cultivated at the same time. The use of square steel for prongs has been adopted instead of round as before. The malleable iron head is of an entirely new design, having V shaped grooves across its upper face, into which the prongs are snugly seated, preventing them from rotating. Any one or more of the prongs can be removed or reversed instantly by loosening one nut on each side of the prong to be removed, which then comes out straight without disturbing any of the other parts. All parts are interchangeable and can be replaced in the event of breakage. The center prong can be removed and the row straddled, or with three or five shovels attached the entire space between the rows may be worked. The shovels are designed in shape and size to work easily, not to make wide ditches with ridges between, and not to throw enough dirt to cover up small

Fig. 2.—The Norcross Hand Garden Cultivator with Handle Detached for Attachment to Wheel Cultivator.

plants. The handles, 4 ft. long, are best grade white ash, waxed and belt finished. The tool weighs about 3½ lb. and the goods are crated for shipping one-half dozen in a compact bundle.

The Novelty Foundry Bucket.

The foundry bucket shown herewith has perfect flush joints made on a strictly dry hot process to reduce danger of shrinkage and leakage to a minimum. The staves and headings are quarter sawed white oak, thoroughly kiln dried. The bail is 9-32-in. round steel; ears are malleable iron; hoops are either black or galvanized; capacity of bucket is 3½ gallons, and weight 8 lb. The buckets are manufactured by the Union Cooperage Company, 4136 North Second street, St. Louis, Mo., which makes the point that they are more durable than galvanized buckets and ordinary pine water buckets often used in foundries.

The Novelty Foundry Bucket with Perfect Flush Joints.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal. bbl. lots
Linseed, Western, Raw	.56 @57
State, Raw	.57 @58
City, Raw	.58 @59
Boiled, 1¢ ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.75 @..
Lard, Prime Winter	.92 @95
Extra No. 1	.57 @58
No. 1	.48 @50
Cotton-seed, Crude, f.o.b. mill	...@...
Summer, Yellow, prime	.5.40@5.45
Summer, White	.5¾@ 5¾
Yellow, Winter	.5¾@ 5¾
Tallow, Acidless	.51 @..
Menhaden, Brown, Strained	.32 @33
Northern, Crude	.22 @23
Southern	.23 @23½
Light Strained	.32 @33
Bleached Winter	.36 @..
Extra Bleached Winter	.38 @..
Cocoanut, Ceylon	℔ lb 7⅝@ 7¾
Cochin	℔ lb 7⅞@..
Cod, Domestic, Prime	.38 @..
Newfoundland	.40 @..
Red Elaine	.43 @47
Saponified	℔ lb 5¾@ 6¾
Olive, Yellow	.1.35@1.40
Neatsfoot, Prime	.55 @56
Palm, Lagos	℔ lb 5⅞@ 6

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	12¼@13
29 gravity, 15 cold test	.13 @13½
Summer	.12 @12½
Cylinder, light filtered	.20 @20¼
Dark, filtered	.17½@18
Paraffine, 903-907 sp. gravity	.14 @14½
903 sp. gravity	.13 @13½
883 sp. gravity	.10½@11
Red	.13 @13½

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer., floated	℔ ton 17.00@18.00
Off color	℔ ton 12.50@15.00
Chalk in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb 45@50
Gilders	℔ 100 lb .52@ .64
Ex. Gilders	℔ 100 lb .56@ .68

Putty, Commercial—℔ 100 lb

In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.50@1.90

Spirits Turpentine—℔ gal.

In Oil bbls	59½@60
In Machine bbls	.60 @60½

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @19

Gum Shellac—

	℔ lb
Bleached, Commercial	.16 @17
Bone Dry	.20 @21
Button	.30 @30
Diamond I	.26 @..
Fine Orange	.20 @21
A. C. Garnet	.18 @18½
Light Orange	.17 @19
Kala Button	.13 @15
D. C	.25 @26
Octagon B	.22 @23
T. N	.15¾@16½
V. S. O	.21 @25

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red, Lead &c.—

	℔ lb
Lead, English white, in Oil	10¼@10⅝
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7¾
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¾
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	5½@ 5¾
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7¼@ 7¾
Green Seal	7⅞@ 8
White Seal	8⅜@ 9
French, Red Seal	8⅝@ 8⅞
Green Seal	10⅛@10⅝

Dry Colors—

	℔ lb
Black, Carbon	.5 @10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.3 @ 5
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @31
Blue, Prussian, Domestic	.28 @30
Blue, Ultramarine	.5 @15
Brown, Spanish	½@ 1
Carmine, No. 40	.2.65@2.75
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Metallic Paint, ℔ ton, Brown	$16.50@$22.00
Red	$14.00@$18.00
Ocher, American	℔ ton $13.00@15.00
American Golden	.4 @ 5
French	.1¼@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.12¾@13
German	.12 @13
American	.8½@10
Red, Indian, English	.5 @ 7
American	.3 @ 3½
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.75@1.50
English	℔ 100 lb $1.15@1.80
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.2¼@ 3
American Burnt and Pow'd	.2¼@ 3
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .80@1.60
English	℔ 100 lb .90@1.60
American	℔ 100 lb, No. 1, .75@ .90
American	℔ 100 lb, No. 2, .60@ .70
Umber, Turkey, Bnt, & Pow.	2¾@ 3
Turkey, Raw and Powdered	2¾@ 3
Burnt, American	2 @ 2½
Raw, American	2 @ 2½
Yellow Chrome, Pure	12¼@13
Oxide Red, American	2 @ 7½
Vermilion, English, Imported	@70
Chinese	$0.90@1.60

Current Hardware Prices.

General Goods.—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists," 218 pages, price $2, prepaid, contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

North's 10%
Upson's Patent 25%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 25%
Ives' Stop Bead Screws and Washers 25%
Taplin's Perfection 25%

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 3, $0.65; 4, $1.00; 5, $0.50.
Quick Shifter, ℔ doz. pairs ..... $2.00@$3.00
Spitzli Quick Shifter, ℔ doz. pairs ..... $1.65@$1.75

Anvils—American—

Eagle Anvils ..... ℔ lb @9 ¢
Hay-Budden, Wrought ..... 9½@9¾ ¢
Trenton ..... ℔ lb 9½@9¾ ¢

Imported—

Swedish Solid Steel Paragon, ℔ lb ..... 10@10½ ¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 10½ ¢; 350 to 600 lb, 11¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00 ..... 15&10%

Augers and Bits—

Com. Double Spur 80%
Jennings' Patn., Bright 65&10@70%
Black Lip or Blued ... 65@65&5%
Boring Mach. Augers 70%
Car Bits, 12-in. twist ..... 40&10%
Ford's Auger and Car Bits ..... 40&5%
Ft. Washington Auger Co 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list 50%
Russell Jennings' ..... 25&10&2½%
Mayhew's Countersink Bits 45%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits ..... 60&10%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist 60%
Snell's King Auger Bits 50%
Snell's Star Auger Bits ..... 50&10%
Swan's Auger Bits ..... 65&10@70%
Swan's, Jennings' Pattern 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Ford's, Clark's Pattern 66⅔%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large size, $26.00 ..... 60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dbl. Cut ..... $3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.25

Hollow Augers—

Bonney Pat., per doz. .$5.50@6.00
Ames ..... 20&10%
Universal 20%

Ship Augers and Bits—

Ship Augers ..... 40&10@50%
Ford's ..... 33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ..... 33⅓&7½%
Snell's 50%

Awls—

Elmore Tool Mfg. Co.:
Tinners' and Brad Awls ..... 55&7%
Scratch Awls 60%

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axles— *Iron or Steel.*

Concord, Loose Collar ... 4¼@4½ ¢
Concord, Solid Collar ... 4½&5 ¢
No. 1 Common, Loose ... 3½@4 ¢
No. 1½ Com., New Style. 4¼@4¾ ¢
No. 2 Solid Collar ..... 4¼@4¾ ¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 70%
Nos. 13 to 14 ..... 70%
Nos. 15 to 18 ... 70&10@70&10&5%
Nos. 19 to 22 ... 70&10@70&10&5%

Boxes, Axles—

Common and Concord, not turned ..... lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent ..... lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—

Caldwell new list ..... 50&10%
Pullman ..... 50&10%

Spring—

Light Spring Balances. 50&10@60%
Chatillon's:
Light Spg. Balances ..... 50&10@60%
Straight Balances ..... 40&10@50%
Circular Balances ..... 50&10@60%
Large Dial ..... 30@30&10%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¼@—¢

Towel—

No. 10 Ideal, Nickel Plate .. ℔ gro. $8.50

Beams, Scale—

Scale Beams ..... 40@40&10%
Chatillon's No. 1 ..... 30%
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ℔ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Split Leather ..... 60@60&10%
Grain Leather ..... 50@50&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$4.50*	*5.50*	*6.00*	*7.00*	*7.50*

Molders—

Inch..	*10*	*12*	*14*	*16*
Doz..	*$8.50*	*11.00*	*13.50*	*14.50*

Net Prices.

Bells— Cow—

Wrought Cow Bells 75%
Jersey ..... 75&10%
Texas Star 50%

Door

Home, R. & E. Mfg. Co.'s ..... 55&10%
Reading Hardware Co 50%

Hand—

Polished, Brass ..... 60@60&10%
White Metal ..... 60@60&10%
Nickel Plated ..... 50&10%
Swiss ..... 50&10%

Miscellaneous—

Farm Bells ..... lb., 2¼@3¢
Church and School .... 60@60&5%

Belting— Leather—

First Quality, Ex. Hy., Strictly Short Lap ..... 60&10%
Standard ..... 70&10@70&10&5%
Light Double ..... 75&10%
Cut Leather Lacing ..... 45@50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Competition (Low Grade). 70&10@75%
Standard ..... 60&10@70%
Best Grades ..... 50@50&10%

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1909 list:
Chain, Parts, Spokes 50%
Tubes 60%

Blocks Tackle—

Common Wooden ..... 75@75&10%
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined. 50&10@60%
Embossed ..... 50&10@60%

Bobs, Plumb—

Keuffel & Esser Co ..... 33⅓&10%

Bolts

Carriage, Machine, &c,—

Common Carriage (cut thread):
⅜ x 6 and smaller 75%
Larger and longer 70%
Common Carriage (rolled thread):
⅜ x 6, smaller and shorter, 75&5%
Phila. Eagle, $3.00 list ... 80@—%
Bolt Ends, with C. & T. Nuts. 70%
Machine (Cut Thread):
¾ x ¼ and smaller ..... 75&5%
Larger and longer ..... 70&5%

Door and Shutter—

Wrought Iron:
Wrought Barrel Japanned, 80&10&10@85%
Barrel Bronzed ..... 60&10@70%
Spring ..... 70&10&10@80%
Square Neck ..... 75&10@80%
Square ..... 80@80&10%
Ives' Mortise Door 25%
Ives' Wrought Door 25%

Expansion—

F. H. Evans' Crescent ..... 40@60%
Richards Mfg. Co ..... 55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type .. 60&10&5&2½%
Star, Wood Screw Type 40%
Star, Machine, Single Wedge 60%
Star, Machine, Double Wedge 60@10%
Star Toggle Bolts 60%
Steward & Romain Mfg. Co.:
Style No. 13, Double ..... 60@10%
Style No. 1, Single ..... 60@10%
Style No. 100, Dbl. Jaw, Single .. 5%
Lag Screw 66⅔%
Star Screw Anchors, Hollow 40%

Plow and Stove—

Plow ..... 65&5@70%
Stove ..... 85&5@85&10%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84 .. 80%
Eagle Phila., list Oct. 16, '84 .. 92½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 .. 80%
Eagle Phila., list Oct. 16, '84 .. 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Phila., list Oct. '84 ..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ... 80%
Phila., Eagle, list Oct. 16, 1881 .. 82½%
Upson Nut Co.:
Tire Bolts 80%

Borers, Bung—

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10%

Braces—

Common Ball ..... $1.50@$1.75
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 61, 106, 206, 614 ..... 50%
C. E. Jennings & Co ..... 50&5%
Mayhew's Ratchet 40%
Mayhew's Quick Action Hay Patent ..... 40&10%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat Revised List ..... 60@60&5%

Brackets—

Wrought Steel ..... 80&5@80&10%
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10%
Stanley's Pressed Steel ..... 75&10&5%
Stanley's Folding Brackets .. 70&10&5%
Taplin Victor Handy Egg Beater Bracket ..... ℔ doz. $1.50

Broilers—

Kilbourne Mfg. Co ..... 75&20%
Wire Goods Co ..... 75&10%

Buckets, Galvanized —

M'fr's list, price per gross, subject to discount of 10&7½&5&5 &10&5%.

Quart 10	*12*	*14*
Water, Light $28.35	*30.75*	*34.75*
Water, Ex. Heavy $6.85	*$9.35*	*53.25*
Fire, Rd. Btm ... $3.50	*35.90*	*39.90*
Well 37.35	*41.35*	*45.35*

Butts— Brass—

Wrought 65%
Cast Brass, Tiebout's ..... 40&10%

Wrought Steel—

BRIGHT.
Light Narrow, Light Reversible ..... 75&5%
Reversible and Broad. 75&10%
Loose Joint, Narrow, Light Inside Blind, &c 75%
Back Flaps, Table Chest. 70%
BRONZED.
Light Narrow, Loose Pin. 55%
Light, Loose Pin, Ball Tip. 65%
Broad 55%

Extra, 5@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35

Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel..... 4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Caps— Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M..$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball..... $1.90
Central Fire..... 25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets..15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—

Bed ..... 65&10@70%
Plate ..... 60@60&10%
Philadelphia ..... 70&10@75%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem (Roller Bearing)..... 70%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list...40&10%

Chain, Proof Coil—

American Coil, Straight Link:

5-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

¾-⅞-1. 1⅛ to 1¼ inch.
$2.90 3.00

German Coil..... 70&5%
German Pattern Coil:
6-0 to 1..... 70&10&5%
2 and 3..... 60&10&10@70%
4, 5 and 6..... 50&10@50&10&5%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 2½, '97..... 70&5%

Covert Mfg. Co.:
Halter ..... 35&5%

Trace, Wagon, &c.-

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$26.00
6½—6-2, Straight, with ring..$27.00
6½—8-2, Straight, with ring..$30.00
6½—10-2, Str'ght, with ring..$35.00

NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for No. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c.....70&10@—%

Miscellaneous—

Jack Chain:
Iron ..... 60&10&10@70%
Brass ..... 60&10&10@70%
Safety and Plumbers' Chain..75%
Gal. Pump Chain....lb., 11½@3%

Bridgeport Chain Co.:
Triumph Halter and Coil..35&2½@40%
Triumph Dog..... 50&10@60%
Brown Halter and Coil.....45@50&5%

Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%

Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%

Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain..50&10%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%

Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set..88¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk—

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 50@55¢
Carpenters' White...gro., 50@45¢

Checks, Door—

Bardsley's 45%
Reading, Ogden..... 20&5%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools..... 55%
Youths' Chests, with Tools..... 40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List..80&10@80&10&10%

Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
R. & E. Mfg. Co.....70@70&10%
Swan's ..... 60&5@60%
L. & I. J. White & Co.....30@30&5%

Tanged—

Tanged Firmers.....35&10@40%

Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
R. & E. Mfg. Co.....25@30&5%
L. & I. J. White Co..... 25&5%

Cold— lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Ch sels, ordinary.... 9@10¢

Elmore Tool Mfg. Co.:
Cold Chisels..... 50&5%

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck..... 40%
Beach Pat., each $8.00..... 35&5%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible..... 35%
Jacobs' Drill Chucks..... 35%
Morrow Ball Bearing Drill Chucks.35%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws..... 35%
Universal, Com. Style Jaws..... 40%
Combination, Reversible Jaws....35%
Combination, Com. Style Jaws...40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks..... 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ..25%
Positive Drive..... 40%
Planer Chucks..... 20%
Standard 45%
Drill Press Vises..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Union Geared Drill Chuck..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%

Clamps—

Carriage Makers', Star, P., S. & W. Co. ..... 50@50&5%
Besly, Parallel..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H, P Screw.40&5%
Myers', Standard and Wenzelmann Hay Rack..... 50%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary....40&5%

Cleavers, Butchers'—

Foster Bros..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Ball Bearing Horse, each.....$7.50
Stewart's New Model Sheep Shearing Machine, each.$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25%

Clips, Axle—

Regular Styles.....80&80&10%

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 75%

Compasses, Dividers, &c.

Ordinary Goods.....75@75&5%

Conductor Pipe,—

	L. C. L. to Dealers: Gal. Steel.	Charcoal. Copper.
Northeastern:		
70&10@—%	50&10&7½%	50&10%
Eastern:		
75@—%	50&10&7½%	50&10%
Central:		
75@—%	60%	50&10%
Northwestern:		
75@—%	60%	50&10%
Western:		
70&10@—%	50&12½%	50&5%
Tennessee:		
70&10@—%	50&12½%	50&10%
Southern:		
70&10@—%	50&12½%	50&5%
Southwestern:		
70@—%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Galvanized, Lined, side handles.

Gal.	2	3	4	6	8
Each	$1.30	1.60	2.00	2 30	3.00

White Enameled Lined, Side Handles:

Gal.	2	3	4	6	8
Each	$2.40	2.80	3.50	4.50	5.60

Agate Lined, Side Handles:

Gal.	2	3	4	6	8
Each	$3.00	3.40	4.30	5.30	6.60

10%

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21¢; lighter than 3 lb. to pair..... 23¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 25¢; No. 7, 25½¢; No. 6, 26½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted..18@20¢
Patent Russia.....lb....20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted...lb.13@14¢
Patent India, Twisted..lb...17¢

Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10..... ℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White...℔ lb 40¢
Massachusetts, Drab....℔ lb 45¢
Phoenix, White, Nos 8 to 12....27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢.
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90@—%
Short Length.....90&20@—%

Hendryx Standard Wire Picture Cord ..... 90&10%
Turner & Stanton Co. Wire Picture Cord ..... 90&10%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.

Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40&5%

Meat and Food—

Enterprise:

Nos..	5	10	12	22	32	
Each	$1.75	$2.50	$2.25	$4	$5	25@25&7½%
No. 202, $1.50.....						40&7½%

P., S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant.....℔ doz. 40&50
Nos.. 305 310 312 320 322
$35.00 $18.00 $14.00 $72.00 $68.00
New Triumph No. 605, ℔ doz. $24.00.
Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $12.00..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater .....℔ doz. $4.00

Tobacco—

Enterprise ..... 25@30%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $31.00..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, 4 to 9 in., ℔ doz..... $6.25
Perfection Post Hole Diggers, ℔ doz, ... $8.25
Split Handle Post Hole Diggers, ℔ doz., $7.25
Hercules Pattern, ℔ doz..... $8.75
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Genuine Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... $1.50@1.75

Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 30&10%
C. & C. Ratchet..... 25%
Reversible Ratchet Die Stocks....25%
Forbes Die Stocks..... 5%
Goodell Automatic Drills 50&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16.
Millers Falls Automatic Drills, 33⅓&10%
Noyes Repair Shop Drill No. 10....20%
Ratchet, Parker's..... 40%
Ratchet, Weston's, Styles A and B.50%
Ratchet, Weston's, Styles C, D and F 45%
Ratchet, Weston's, Style H Improved 45%
Ratchet, No. 012..... 50%
Ratchet, Celebrated..... 50%
Ratchet, Whitney's, P., S. & W..50%
Star Drills..... 60%
Star Pipe Drills..... 50&10%
Sebco Extension Drills..... 40&10&5%
Star Drill Holders..... 50&10&10%
Star Drill Points..... 50&10&10%

Twist Drills—

Bit Stock..... 70@70&10%
Taper and Straight Shank ..... 65@65&10%

Drivers, Screw—

Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&7½%
Standard Neverturn..... 66⅔%
Star ..... 75&5%
Screw Driver Bits..... 25%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 45%
Mayhew's Monarch..... 45%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	Gal. Steel.	Copper
Northeastern..	*75&10&5%*	*50&10%*
Eastern.....	*80%*	*50&10%*
Central.....	*80&10&5%*	*50&10%*
Northwestern..	*80&10&5%*	*50&10%*
Western	*80&5%*	*50&5%*
Tennessee.....	*80&5%*	*50&10%*
Southern.....	*75&10%*	*50&5%*
Southwestern..	*75&10&2½%*	*50&5%*

Terms.—2% for cash. Factory shipments generally delivered.

Note.—Lower prices are quite general owing to market irregularities.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4..... 30%
Sizes 7½, 2½, 3½, 5, 6...60&10%
No. 26..... 50%
No. 24..... 25%
Copper Elbows..... 50%

Emery, Turkish—

	¼ to ⅝:	⅝ to 220:	Flour.
Kegs ..... *lb.*	5 ¢	5½¢	8½¢
½ *Kegs*..... *lb.*	5¼¢	5¾¢	8¾¢
¼ *Kegs*..... *lb.*	5½¢	6 ¢	9 ¢
10-lb. cans, 10 *in case*....	6½¢	7 ¢	8 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 *to* 3 *tons a discount of* 10% *is given.*

Extensions, Bit—

Ford's Auger Bit Extensions....40&5%

Extinguishers—Fire

Royal Mfg. Co. Fire, ℔ doz., $12.00 .....50%

Fasteners, Blind—

Zimmerman's Jap'd and Galv., 65%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....25%

Cord and Weight—

Ives, ℔ gro., $1.08.....25%
Titan, ℔ gro., $0.66.....25%

Corrugated

Acme Corrugated Fasteners.....70%

Faucets—

Cork Lined.....50&10@60%
Metallic Key, Leather Lined, ... 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ℔ doz., $36.00.....40&10%
Lane's, ℔ doz., $36.00.....40&10%

Files— Domestic—

Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Fitchburg 80%
Gold Medal.....70%
Heller Bros.....70&10@75&10%
Liveright Bros., Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%
McCaffrey's Swiss Pattern.....45&10%
Simonds 70%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.....	$3.00	3.25	3.55	4.00

Peck, Stow & Wilcox Co.:

In.....	15	17	19	21	24
	$4.00	4.40	4.75	5.50	6.50

Reading Hardware Co.....20%
.....50&10%

Frames— Wood Saw—

White, S'g't Bar, per doz.80@$1.00
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.....	1	2	3	4	6
Each....	$1.25	$1.60	$1.90	$2.20	$2.80

Fuse— *Per 1000 Feet.*

Hemp	$2.75	10&2½%
Cotton	3.20	
Waterproof Sgl. Taped..	3.65	
Waterproof Dbl. Taped..	4.50	
Waterproof Tpl. Taped..	5.15	

Gates, Molasses and Oil—

Stebbins' Pattern.....80@80&5%

Gauges—

Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....25%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.50; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glasses, Level—

Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25&10@50%

Grease, Axle—

Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—

Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand Power, each, Nos. 01, $1.75; 02, $2.25; 1A, $2.50; 1B $3.25.. 33⅓%
Foot Power, No. 10, $5.00.....33⅓%
Encased Gears, No. 15. Hand Power, $13.50; Combined Hand and Foot Power, $15.00.....33⅓%
Lawn Mower Grinder, No. 40, $3.75 .....33⅓%
Sickle Grinder, each, No. 20, $5.00 .....33⅓%
Cast or Cut Gears.

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....70&10@—%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'..65&10@65&10&10%
Heller's Farriers'.....40@40&10%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' 50%
Riveting 50%
Machinists' 50%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Victor Magnetic Tack, ℔ gro....$7.75

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins' 35%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—

Auger, assorted...gro.$3.00@$3.50
Brad Awl.....*gro.$1.65@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....*$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory.....*1.60@1.75*
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....*gro.$1.30@$1.40*
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....*65@75¢*
Plane Handles:
Jack, doz., 30¢; Fore, doz...*45¢*
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%

W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.20; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 30 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.
50%

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ℔ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
F. E. Myers & Bro. Stayon; O K; O K Adjustable; Sure Grip; Sure Grip Adjustable; Sure Grip Tandem; Sure Grip Tandem Adjustable; Tandem Adjustable 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13,$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%

Extra 5@10% often given.

Hangers— Garment—

Pullman Trouser, ℔ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.80; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....℔ gro. $9.60

Joist and Timber—

Lane Bros. Co.....35%

Hasps—

Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—

Regular list, first qual.50&10@60%
Second quality.....*60@60&10%*

Heaters, Carriage—

Clark, No. 5, $1.25; No. 5R, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 1, $3.00 .....25%
Big Hit Assortment, ℔ case....$13.80
Leader, ℔ case.....$9.00
Clark Coal, doz.....$0.75
A B C Coal, doz.....$0.60
Sadiron Coal, box 50 pieces.....$0.75

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.60.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $3.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....50&10%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $1.00; with screws, $1.30.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only.....	1.25	1.90	3.50
Latches only.....	.70	.75	.35

New England:
With Latch.....*doz*..@$2.00
Without Latch.....*doz*..@$1.60
Reversible Self-Closing:
With Latch.....*doz*..@$1.75
Without Latch...*doz*. ...@$1.35
Western:
With Latch.....*doz.* $1.75
Without Latch.....*doz*..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—

Griffin Mfg. Co., Fleur de Lis Surface Hinges, ℔ doz. prs.....$1.00

Pivot Hinges—

Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co., Matchless..50&10%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....℔ gro. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triplex Spring Hinges.....50%
Chicago (Ball Bearing) Floor.50%
Chicago Engine House.....25%
Lavatory Door Hinges.....50%
Adjustable Screen Door.....60%
Non-Holdback 65%
Lawson Mfg. Co.:
Matchless Spring Hinges..... 30&10&10%
Matchless Jamb Hinges..... 30&10&10%
Lavatory .....50&10%
Surface Floor.....60&10%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c.:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T....65&10%

Extra, 5@—

Screw Hook and Strap.
6 to 12 in..lb. 5½¢
14 to 20 in..lb. 5¼¢
22 to 36 in..lb. 5 ¢

Screw Hook and Eye:
¾ to 1 inch.....*lb.* 5½¢
⅝-inch .....*lb.* 6½¢
½-inch .....*lb.* 8½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers...2&2%

Hods— Coal—

M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*	10&5%
Galv. Open	*$35*	*$39*	*$42*	*$46*	
Jap. Open	*26*	*28*	*31*	*35*	
Galv. Funnel	*43*	*48*	*52*	*56*	10&5%&5%
Jap. Funnel	*33*	*36*	*39*	*43*	

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Broom—

Pullman Broom, ℔ gro.....$9.00

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ doz. $2.00

Nipple—

Curtis Nipple Holders.....5%

Trace and Rein—

Fernald Double Trace Holder, ℔ doz. pairs.....$1.25
Dash Rein Holder, ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast—

Bird Cage, Reading.....50%
Clothes Line, Reading List.....50&5%
Coat and Hat Iron, Reading.....50%
Coat and Hat, Bronze Metal, Reading.....33⅓%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....50%

Wire—

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 75@75&10%; Crown, 75&10@60%; Czar, 70%; Capitol 80%; Czar Harness, 50&10%; Ceiling, 75@80%.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9¼@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons— Sad—

From ½ to 10.....lb. 2½@2¾¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Caps	*.86*	*.93*	*.96*	*.98*
Tin'd Caps	*.91*	*.88*	*1.01*	*.98*

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
American Fork & Hoe Co.:
Easy Cut, ℔ doz. No. 10 C H...$2.10
Easy Cut, ℔ doz., No. 10 B C H..$2.20
Acme, ℔ doz.....$2.35
Dent, ℔ doz.....$2.35
Adjustable, Serrated, ℔ doz.....$1.90
Serrated, ℔ doz.....$1.85
Yankee, No. 1 C H.....$1.35
Yankee, No. 2 C H.....$1.15

Drawing—

Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....℔ doz. $9.00
Iwan's Serrated.....℔ doz. $9.50

Miscellaneous—

Farriers'.....doz. $2.60@3.55
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co.'s list, Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....50&10%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0....doz. $4.00@4.50
Side Lift, No. 0...doz. $4.25@4.75
Hinge Globe, No. 0. doz. $4.25@4.75
Other Styles.....40&5%

Bull's Eye Police—

3-inch.....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws.....doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Lifters, Transom—

Reading, Iron, 50&5%; Bronze Metal.....33⅓%
R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 30%
Masons' Lines, Shade Cord, &c.; White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....30%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....30%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....40%
Shade Cord, Cotton or Linen.....30%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....33⅓
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Crescent.....25%
Automatic Gravity Metal Sash, ℔ gro., $149.58.....25%
Window Ventilating.....25%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks, Iron.....50%
Reading Sash Locks, Bronze Metal, 33⅓%

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power... ℔ doz. $48.00

Forming, Bending, Etc—

Royal Forming, Bending, Crimping and Fluting, Hand Power, each, $20.00.....40%

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%
Everlasting Flexible Steel.....40%

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Bone, Shell and Corn.....25&10%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@ 20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	14	16	18-in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental, High and Low Wheel, 50&10%
Great American.....66⅔%
Great American Ball Bearing....66⅔%
Quaker City.....66⅔%
Pennsylvania, High and Low Wheel, 50&10%
Pennsylvania, Jr., Ball Bearing 50&5%
Pennsylvania Golf, 6 Knives, Low Wheel, 33⅓%; High Wheel.....45%
Pennsylvania Golf, Ball Bearing, 7 Knives, High Wheel.....33⅓%
Pennsylvania Horse, 30 and 38 inch, 33⅓&5%
Pennsylvania Pony or Two Man.40&5%
Pennsylvania Grand Horse, 30 and 38 in.....33⅓%

Nails—

Wire Nails and Brads. Miscellaneous.....85&5@85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd, gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—

Brass.....30%
Plated.....30&10%

Nuts— *Blank or Tapped.*

Cold Punched: *Off list.*
Square.....5.20¢
Hexagon.....5.80¢
Square, C., T. & R.....5.60¢
Hexagon, C., T. & R.....6.40¢
Hot Pressed: Off list.
Square.....5.60¢
Hexagon.....6.10¢

Oakum—

Best.....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy.....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10@70%
Railroad.....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers, Can—

Triumph Shear Can Openers, doz..$1.20

Egg—

Hartigan Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....13¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb, 80¢.....25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute.....lb. 4@4¼¢
Russia Packing.....lb. 9@10¢

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75&10@80%

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos Paper, ton $37.50@$40.00
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft...2½¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.....2¾¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 58@70¢
Heavy weight, 40 lbs. to roll. 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....$54.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton. $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
New Lightning.....℔ doz. $7.00
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
New Century.....each $20.00
Ranger.....each $25.00
Rapid Apple Slicer.....each $100.00
Reading Hardware Co.:
Advance.....℔ doz. $4.00
Baldwin.....℔ doz. $4.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25

Orange—

Goodell Co., Success.....each $20.00

Potato—

Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List.....75&10%
Cronk's Handled Garden Mattock, ℔ doz., $6.00.....33⅓%

Pins, Escutcheon—

Brass.....50@50&10%
Iron.....60@60&10%

Pipe, Cast Iron Soil—

Eastern Prices:
Standard, 2-6 in......68%
Extra Heavy, 2-6 in.....74%
Fittings, Standard and Heavy.....80¾%
Extra, 10 & 10&5%

Pipe, Merchant—

Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..				
⅜ in.....				
½ in.....				
¾ to 6 in....				
7 to 12 in....				

See Trade Report

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class.....85%
Second-class.....87%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$5.90	$6.90
6 in., Uniform Color..	6.40	7.40
7 in., Uniform Color..	7.40	8.40

Planes and Plane Irons—

Wood Planes—

Bench, first qual......30@30&5%
Bench, second qual.....40@40&5%
Molding.....25@25&5%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union.....60%

Iron Planes—

Union.....60%

Plane Irons—

Wood Bench Plane Irons....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $7.50

Plates—

Felloe.....*lb.* 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—

Never-Break.....75&10%

Pliers and Nippers—

Button Pliers.....75&5@75&10%
Gas Burner, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45, $1.50.
Gas pipe.. 7 — $2.00; 8 — $2.25; 10 — $2.75; 12-in. — $3.50
Acme Nippers.....50%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's.....60%
No. 89 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers.....70%
Wire and Cutting Pliers.....75%
Heller's Farriers' Nippers, Pincers and Tools.....40@40&10%
P., S. & W. Tinners' Cutting Nippers.....20%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston & Sons:
Shafting Levels.....60&10%
Pocket Levels.....60&10%
Plumbs and Levels.....60&10%
Track Level and Gauge.....60&10%
Woods' Extension.....33⅓%

Points, Glaziers'—

Bulk and 1-lb. papers....lb. 9¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10¢

Police Goods—

Manufacturers' Lists..25@25&5%

Polish—Metal, Etc—

Ladd Co.:
Putzade Liquid, ℔ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ℔ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside.....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese.....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Window Polish—

Benj. P. Forbes:
Glasbright, 1 lb cans, each.....75¢
Glasbright, Factory, 10 lb pails, ℔ lb.....25¢

Poppers, Corn—

1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square..doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro.$15.00

Pots, Glue—

Enameled.....40%
Tinned.....30&10%

Powder—

Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
Discount to the trade, 10%.
NOTE.—Prices vary according to territory.

Presses—

Enterprise Mfg. Co., Fruit, Wine and Jelly.....20@25%
Lard Presses and Sausage Stuffers.....25@25&7½%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%
Morrill's Pocket, $20.00.....50%

Pruning Hooks and Shears

See *Shears*.

Pullers, Nail, Etc.—

Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers.....10%
Nail Pullers.....40%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00.....50%
Pearson Spike Puller, each, $15.00..25%
Parrot Tack and Stub Pullers, ℔ doz.....$1.20
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz	$0.50	.15	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz...	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle.....50&10%
Wrought Steel, Eagle, ℔ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in.....27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ℔ doz.....19¢
Common Sense.....℔ doz. 20¢
Merit, ℔ doz., 2¼ in.....37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—*See Blocks.*

Pumps—

Cistern.....60%
Pitcher Spout.....75&10&5@80
Wood Pumps, Tubing, &c....50%
Barnes Mfg. Co.:
Dbl. Acting (low list).....50%
Pitcher Spout.....80%
Daisy Spray Pump.....℔ doz. $6.50
Goulds Mfg. Co.:
Double-Acting Thresher Tank.. $5.00
Diaphragm No. 3, Side Suction.$14.50
Empire, Advance, Seneca, D, A, Shallow and Deep Well (low list).....50%
Spraying and Whitewashing.....$2.45
F. E. Myers & Bros. (low lists):
Double Acting Force and Lift; Cistern and Well; House; Windmill; Ratchet Handle; Pump Stands; Hydro-Pneumatic; Bulldozer Power; Spray; Ashland Force and Lift.....50%
Thresher Tank—Myers and Faultless Low Down Tank.....$5.00
Century Low Down Tank, No. 470.....$5.25
Century Low Down Ratchet Handle Tank, No. R470.....$5.50
Spray Pumps.....50%

Pump Attachments—

Chicago Hdw. & Fdy. Pump Spout Attachments, each.....$0.27

Pump Leathers—

Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch....	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

30@30&5%

Punches—

Saddlers' or Drive, good, doz.50@75¢
Spring, single tube, good quality.....$1.75
Revolving (4 tubes)....doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Elmore Tool Mfg. Co.:
Machinists' Center.....40%
Tinners': Solid, 50%; Prick.....50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55%
Tinners' Hollow, P., S. & W. Co..25%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....40&10%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢.....30%
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft.....$3.45
O. N. T., ℔ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
Trolley, No. 301, ℔ ft.....9¢
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢. 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&10%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—

Cronk's:
Steel Garden: Champion, ℔ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ℔ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ℔ doz., 20 teeth, $2.35; 24, $2.50.....net
Anticlog Lawn, ℔ doz.....$3.50
Malleable Garden.....70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Jumbo Lawn, 36-tooth....℔ doz. $5.00
Lawn Queen, 20-tooth....℔ doz. $2.65
Lawn Queen, 24-tooth....℔ doz. $2.75
Paragon, 20-tooth.....℔ doz. $2.40
Paragon, 24-tooth.....℔ doz. $2.50
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.,.....70&5@70&10&5%
Liveright Bros.' Gold Medal.....70%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

W. H. Compton Shear Co.....30%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo., Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1210 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 92084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed.....70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal.40%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$2.00
Double Action, 44 caliber...$2.00
Automatic.....$4.00
Hammerless.....$4.50

Riddles, Hardware Grade

16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	⅜	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.35 doz.

Hog Rings and Ringers—

Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz.85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz.65@70¢

Rivets—

Copper Rivets and Burrs, 50@50&10%
Tinners' and Miscellaneous Rivets.....80&5%

Bifurcated and Tubular—

Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@65¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—

Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Myers' Stay.....60%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—

Manila, 7-16 in. diam. and larger: Highest Grade.....lb.8¾@8¼¢
Lower Grades.
Sisal, 7-16 in. diam. and larger: Highest Grade....lb.7½@7¾¢
Commercial Grade.....lb.6½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure.....*lb.*7¾@8¢

Sisal, Tarred, Medium Lath Yarn:
Pure ..... *lb. 6¾@7¢*
Cotton Rope:
Best, ¼-in. and larger. 16½@20¢
Medium, ¼-in. and larger. 15@16¢
Common, ¼-in. and larger.. 7½¢
In coils, ½c advance.
Jute Rope:
Rove, No. 1, ¼-in. and up.
lb. ..... *5@5½¢*

Wire Rope—

Galvanized ..... *47½&2½%*
Plain ..... *55&2½%*

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules

Boxwood ..... *60&5%*
Ivory ..... *25&5%*
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Upson Nut Co., Boxwood.....60&5%

Saws—

Atkins':
Circular 45%
Band .....50@50&10%
Butcher Saws.....50%
Cross Cuts.....35%
One-Man Cross Cut.....40%
Narrow Cross Cut.....50%
Hand, Rip and Panel.....35&5%
Miter Box and Compass.....40%
Mulay, Mill and Drag.....45%
Wood Saws.....40&10%
Chapin-Stephens Co.:
Turning Saws and Frames.30@30&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 18 in. wide.....60%
Band, ⅛ to 1¾.....60%
Crosscuts 45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....40%
Framed Woodsaws.....25%
Woodsaw Blades.....25%
Woodsaw Rods, Tinned.....15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Hand Ice Saws.....45%
Butcher Saws and Blades.....30%
C. E. Jennings & Co.'s:
Back Saws.....16⅔%
Butcher Saws.....5&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws.....25&7½%
Hand Saws.....12½%
Wood Saw Blades.....33⅓&7½%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Massachusetts Saw Works:
Victor Kitchen Saws.....40&10&50%
Butcher Saws Blades.....35@40%
Peace & Richardson's Hand Saws.30%
Simonds':
Circular Saws.....45%
Crescent Ground Cross Cut Saws.30%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.40%
Band Saws.....50%
Hack Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..40%
Disston's:
Concave Blades.....25%
Chromol Blades.....35%
Hack Saw Frames.....30%
Simonds, 35%; Bay State, 40%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades....40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Griffin Co. Hack Saw Blades.....50%
Star Hack Saws and Blades.....
Sterling Hack Saw Blades..3[illegible]
Sterling Hack Saw Frames..30&[illegible]
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....20%
Victor Hack Saw Frames.....40%
Victor Hack Saw Machines, each..$75.00

Scroll—

Barnes, No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $3.50 and $4.00... 15&10%

Scales—

Union Platform, Plain. $2.10@2.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales.....50%
Reading Hardware Co.....50&5%
The Standard Portables.....40%
The Standard R. R. and Wag-

Scrapers—

Chapin-Stephens Co., Box..30@30&10%
Richards Mfg. Co., Foot.....60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¾, $3.50@3.75
Bench, Wood.....20@20&10%
Hand, Wood....70&10@70&10&10%
Chapin-Stephens Co., Hand..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point.....75&10&10%
Coach, Gimlet Point...75&10&5%
Hand Rail.....70&10@75%

Jack Screws—

Standard List.....70&10@75%
Millers Falls.....50&10&10%
Swett Iron Works.....70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head.....40@40&10%
Rolled Thread, F. H. or R. H., Iron .....75&10%
F. H. or R. H., Brass, Nos. 8 to 14.....65&10%

Set and Cap—

Set (Iron).....75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....70&10&7½%
Hex. Hd. Cap.....70&10&7½%
Rd. Hd. Cap.....50&7½%
Fillister Hd. Cap.....60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron.....87½&5@..%
Round Head, Iron....85&5@..%
Flat Head, Brass.....80&5@..%
Round Head, Brass..77½&5@..%
Flat Head, Bronze....75&5@..%
Round Head, Bronze. 72½&5@..%
Drive Screws.....87½&5@..%

Scythes— *Per doz.*

Plain Grass, Cutting Edge Polished .....$6.25@$6.50
Clipper, Bronzed Web. $6.50@$6.75
Solid Steel, Web and Backs Polished .....$7.00@$7.25
Bush, Weed and Bramble, Painted .....$6.50@$6.75
Grain, Painted, Cutting Edge Polished .....$8.25@$8.50
Clipper Grain, Bronze Web. $8.50@$8.75

Seeders, Raisin—

Enterprise .....25@30%

Sets— Awl and Tool—

Fray's Hollow Tool Handles, Nos. 1, $12; 2, $16; 3, $12.....50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros.....27½%
Elmore Tool Mfg. Co.....30%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled, Cup Pt....℔ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut....℔ doz. $6.00
Morrill's No. 1.....$15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill.....$30.00
Nos. 10, 11, 95.....$15.60
No. 1 Old Style.....$10.00
Special $16.25
Royal, Hand.....℔ doz. $3.50
Seymour Smith & Son's.....65%
Taintor Positive.....℔ doz. $6.75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz.....$1.50
Mounted Kitchen Sand Stone, ℔ doz.....$1.50
Natural Grit Carving Knife Hones, ℔ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz.....$1.50
Quick Edge Pocket Knife Hones, ℔ doz.....$2.50

Lawn Mower—

Pike Mfg. Co., 12, 14, 16, 18 and 22 in., doz., $6.00.....33⅓%

Shavers, Beef—

Enterprise Mfg. Co.....25@30%

Shaves, Spoke—

Iron .....doz. $1.25
Wood .....doz. $2.00
Chapin-Stephens Co.....30@30&10%
Millers Falls Co., ℔ doz., $9.00.15&10%
Seymour Smith & Son's.....30%

Shears—

Cast Iron..	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap.....70&10&5%
Best Quality Nickel...60&10&5%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40%
Columbian Cutlery Co.:
Sheep, 1900 list.....30&10&5%
Grass .....50&10%
Horse or Mule.....50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel.....50&10&5%
Tailors' 30%
J. Wiss & Sons Co.:
Best Quality Jap'd.....60&10%
Best Quality Nickeled.....50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10%
Acme Cast Snips.....40%
W. H. Compton Shear Co., Forged Steel Handles.....35%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in.....33⅓&7½%
Niagara Snips.....40%
P., S. & W. Forged Handles 25%
Forged Handles, Steel Blades, Samson .....40@40&5%
Triumph Stove Pipe, doz.....$6.00
J. Wiss & Sons Co.:
Wiss Forged Steel.....25%

Pruning Shears—

Columbian Cutlery Co.:
Hedge, Wilcut Brand.....60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel.....35%
Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz, $18.00.....25%
Disston's Pruning Hook only, ℔ doz., $12.00.....25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades.....40%
P., S. & W. Co.....40%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners.....75&10%
Wood Handle Pruning Shears....40%

Sheaves—Sliding Door—

Reading 40%
R. & E. list.....15%

Sliding Shutter—

Reading list.....40%
R. & E. list.....15%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge.....60&5%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Arrow, 10, 12, 16 and 20 gauge; Leader grade .....25&5%
New Club, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Nitro Club, 10, 12, 16 and 20 gauge; New Club, 14, 16 and 20 gauge; Repeater Grade.....20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade .....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders.....40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder.....40%

Shingles, Metal— Per Sq.

Wheeling Corrugating Co.:

Dixie, 14 x 20 in....	$4.05	$5.05
Dixie, 10 x 14 in....	4.25	5.45
Dixie, 7 x 10 in....	5.25	6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg. $4.10
Steel .....per keg. $3.85
Burden's, all sizes.....℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to B.....$1.60
Drop, B and larger.....1.85
Buck 1.85
Chilled 1.85
Dust 2.30

Shovels and Spades—

Association List..40&7½@40&10%
Avery Stamping Co.....40%

Snow Shovels—

Long Handle.....$2.50@$2.75
Wood and Mail, D Handle, $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro.....$9.50
Hunter's Genuine, per gro..$12.00

Sieves, Seamless Metallic

Per dozen.

Mesh	*1½*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@1.05
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in.....60%
20 x 24 to 24 x 50 in.....50%
24 x 60 to 24 x 120 in.....30%
Barnes' low list, all sizes up to 20 x 40, 60%; larger sizes.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Steel—

Steel Sinks, L. & G. list.....60%

Skeins, Wagon—

Cast Iron.....70@70&10%
Steel .....35@40%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&7 tens.
Victor A, Noiseless. 60&4 tens &5%

Sleds—

Little Giant Folding, ℔ doz.....$12.00

Snaps, Harness—

German .....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan.....40%
Jockey 25%

Snaths—

Grass Scythe.....50@50&5%

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co:
1847 Rogers Bros.....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous

German Silver.....60@60&5%

Tinned Iron—

Teas .....per gro. 50@55¢
Tables .....per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check.....40%
Chicago (Coil).....40&10%
Pullman Door (Coil), ℔ gro.....$10.00
Pullman Gate.....10%
Reliance (Coil).....40&10%

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black .....$4.75@$5.00
Half Bright.....$4.75@$5.00
Bright .....$5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26....per pair. 45@47¢
1½ x 3 x 28....per pair. 68@71¢

Sprinklers, Lawn—

Enterprise .....25@30%
Hero Fruit Jar Co., ℔ doz.....$4.50
Philadelphia No. 1, ℔ doz, $12; No. 2, $15; No. 3, $20.....30%

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *80@80&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.00
Iron, Porcelain Lined...doz. $1.75
Victor, ℔ gro.....$9.00

Staples—

Barbed Blind.....85&5@85&10%
Electricians' .....80&10&10@85%
Fence Staples, Polished, $1.80; Galvanized $2.10
Poultry Netting Staples..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros.'.....30%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plate.....25%

Stoners, Cherry—

Enterprise .....25@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies.....40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list: ₱ lb
Arkansas St. No. 1, 3 to 5½ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$1.00
Lily White Washita, 4 to 8 in..60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)...33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....40%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small..₱ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....10¢
Sand Stone.....6¢

33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $8.50
Green Mountain S. S.₱ gro. $7.00
Extra Indian Pond S. S.₱ gro. $8.00
No. 1 Indian Pond S. S.₱ gro. $7.50
No. 2 Indian Pond S. S.₱ gro. $5.00
Leader Red End S. S.₱ gro. $5.00
Quick Cut Emery....₱ gro. $10.00
Pure Corundum.....₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat.$11.00
Emery Scythe Rifles, 4 Coat.$13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ₱ gro., $12.00 $12.00 .....33⅓%
Lightning (Artificial), ₱ gro., $18.00 .....33⅓%

33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00....50%
Morrill's, No. 2, $12.50.....50%
Seymour Smith & Son's.....60%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stevens Co.....20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stroppers, Razor—

Pullman Safety Razor Blade, doz.$8.50

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses.....25@25&7½%
P., S. & W. Co.....40&10&5%

Swings, Lawn—

Myers' Low Down Roller.....$6.25

Tacks, Finishing Nails, &c.

American Carpet Tacks 90&25@—%
American Cut Tacks..90&25@—%
*Swedes' Cut Tacks.*L..90&30@—%
Swedes' Upholsterers'.90&35@—%
Gimp Tacks.....90&35@—%
Lace Tacks.....90&35@—%
Trimmers' Tacks.....90&30@—%
Looking Glass Tacks.....65@—%
Bill Posters' and Railroad Tacks, 90&40@—%
Hungarian Nails.....80@—%
Finishing Nails.....70@—%
Trunk and Clout Nails.75&5@—%
NOTE.—The above prices are for Straight Weights.
See also Nails, Wire.

Double Pointed—

Double Pointed Tacks, 90&6 tens@—%

Tapes, Measuring—

American Asses' Skin....50@—%
Patent Leather.....25@30&5%
Steel .....33⅓&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@ 35&5%; Pocket, 35@35&5%.

Lufkins:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather...25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lb......$2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c......30@35%

Ties, Bale—Steel Wire—

Single Loop.....82½&10%
*Monitor, Cross Head, &c.*70&2½%

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tops, Chimney—

Iwan Volcano Chimney Tops.....55%

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Ice Tools—

Gifford-Wood Co.....15%

Saw—

Atkins' Cross Cut Saw Tools.....35%
Simond's Improved.....33⅓%
Simonds' Crescent.....30%

Ship—

L. & I. J. White.....25%

Torches—

Hammers, Engine, ₱ doz.....$1.50

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro.$13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse .....50&5%
Hawley & Norton.....65&10%
Victor .....75@75&10%
Oneida Community Jump.....70&5%
Stop Thief.....60%
Tree Trap.....60%
Hector .....75@75&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz.85@90¢

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston " Standard Brand " and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in 1 doz. boxes, ₱ gro. $6.50
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

McKinney Trucks.....each, net $10.00

Tubs, Wash—

	No. 0	1	2	3
M'fr's list, price per gross, subject to discount of 10&7½&5&5&10&5%.				
Galvanized.....	$67	$79	$91	$103

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls .21@23¢
No. 12, ¼ and ½-lb. Balls .19@21¢
No. 18, ¼ and ½-lb. Balls .16@18¢
No. 24, ¼ and ½ -lb. Balls. 15½@17½¢
No. 36, ¼ and ½-lb. Balls .15@17¢
Chalk Line, Cotton ½-lb. Balls .....*24@29¢*
Cotton Mops, 6, 9, 12 and 15 lb. to doz......*8½@21¢*
Cotton Wrapping, 5 Balls to lb., according to quality..13½@21¢
American 2-Ply Hemp, ¼ and ½-lb. Balls......*12½@15¢*
American 3-Ply Hemp, 1-lb Balls .....*13½@16¢*
India, 6-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine)...7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls .....*9@11¢*
Mason Line, Linen, ½-lb. Bls.17¢
No. 26½ Mattress, ¼ and ½ lb. Balls, according to quality. 30@60¢
Wool, 3 to 6 ply....B 6¢; A 7½¢

Vises—

Solid Box.....60@60&10%

Parallel—

Fisher & Norris Double Screw Leg, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00.....20%
Fisher-Brooks Bench and Woodworkers' Vises, No. 0, $3.80; No. 1, $5.90; No. 2, $8.25; No. 3, $10.50; No. 4, $13.50.....40%
Merrill's 25%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss Vise Co.:
Patent, Bicycle, Shepard, Gipsy, Adj. Column, Lewis Adj. Jaw..25%
Rapid Transit, Heavy Chipping..30%
Bull Dog, Anchor Line, Yankee Quick Lever, Lewis Solid Jaw, Eclipse Wrench Attachment...40%
Monarch 45%
Vise Jaw Caps 10%
Pullman Automatic Bench, ₱ doz., No. 1, $7.50; No. 2.....$9.50

Pipe—

Curtis & Curtis Malleable.....25%
Parker's Combination:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Prentiss Vise Co.:
Blake Combination, Prentiss Combination, Prentiss.....60%
Malleable; Monarch Combination 65%
Rex Combination.....70%
Peerless Pipe Grip.....25%

Saw Filers

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps.....30%
Reading .....50&10%

Wood Workers—

Prentiss Cabinet Makers'.....40%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs .....*$2.75@$3.00*
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
El-an-ge .....60&10%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	65¢	85¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles .....65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd.....60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles .....65&5%
Solid Steel Kettles.....60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

No.	₱ doz.
800—Brass King, Single Surface, Open Back.....	$3.00
801—Brass King, Single Surface, Open Back.....	$2.50
802—Brass Junior, Single Surface, Open Back.....	$2.25
862—White Hen, Spiral Crimp Glass	$3.15
964—Royal Blue Enamel, Single Surface, Ventilated Back.....	$3.25
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
190—Northern Queen, Single Zinc, Perforated, Open Back.....	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back...$2.80	
710—Regal, Single Zinc, Extra Family Size, Ventilated Back.....	$2.50
760—Banner Globe, Single Zinc, Ventilated Back.....	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Pail Size.$1.25	

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%

Coil:	¾	1	1¼	1¼ *inch.*
	9¢	10¢	11¢	14¢ *per box.*

Iron or Steel—

Size bolt....	5-16	⅜	½	⅝	¾
Washers....	$4.90	4.00	2.70	2.50	2.30

The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ₱ 100 lb. discount; in 100 lb kegs, add 10¢ net ₱ 100 lb; in 5 or 10 lb boxes, add 50¢ net ₱ 100 lb; in 1 lb boxes, add $1.00 net ₱ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish.....*lb., 2¼@2¾¢*

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per net ton.....*$24.00@$25.00*

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Market and Stone Wire in Bundles—

Bright and Annealed:
9 and coarser.....80%
10 to 18.....80&10%
19 to 26.....80&10&2½%
27 to 36.....80&5%
Galvanized:
9 and coarser.....75&10%
10 to 16.....75&10%
17 to 26.....72½&10%
27 to 36.....72½%
Coppered:
9 and coarser.....75&10%
10 to 26.....75&10%
27 to 36.....70&10&5%
Tinned:
6 to 18.....75&10&10%
Brass.....15¾¢ *lb., base*
Copper.....17⅞¢ *lb., base*
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper..60&10&10&10%
Retailers' Assortments, per box. $1.90@$2.10

Bright Wire Goods—

Steel Wire Goods.....90&35%
Brass Wire Goods.....90&35%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75&10@80&5%
Alligator or Crocodile.70&10@75%
Baxter Pattern S Wrenches. 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut.....50&5%
Combination Black.....50&5%
Merrick Pattern.....50&5%
Coes' Genuine Knife Hdl...40&10%
Coes' Genuine Steel Hdl...40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' " Mechanics' "...40&10&10&5&5%
Hercules 70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W..50&10%; full cases.....50&10&5%
Vulcan and Agrippa Chain.....50%
Wizard Adjustable Ratchet.....50%

Can and Jar—

Bent, P. Forbes Triumph, doz., $0.75; Triumph Syrup Cap, gro. $4.00

Wrought Goods—

Staple Hooks, &c., list March 17, '98.....*90@—%*

Zinc—

(Cask lots, 600 lb., at mill.)
Sheet.....*per 100 lb., $7.50*

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ ℔ 1.80¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.00¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.00¢

Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.05¢
3 in. x 3-16 in. and ⅛ in.	2.25¢
1¼ to 2½ in. x ⅛ in.	2.05¢
1½ to 2¾ in. x 3-16 in. and thicker	1.95¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅞ x ⅛ in.	2.25¢
¾ x ⅛ in.	2.35¢
⅝ x ⅛ in.	3.40¢
⅛ x 3-32 in.	3.90¢

Tees:	
1 in.	2.35¢
1¼ in.	2.15¢
1½ to 2½ in.	2.00¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.15¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.30¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.80¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ ℔ 2.80¢	2.90¢
Nos. 18 to 21	₩ ℔ 2.85¢	3.00¢
Nos. 22 and 24	₩ ℔ 2.95¢	3.10¢
No. 26	₩ ℔ 3.00¢	3.10¢
No 28	₩ ℔ 3.10¢	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ ℔ 12 @14¼

Patent Planished, W. Dewees Wood, ₩ ℔ A, 10¢; B, 9¢ net.

Galvanized.

Nos 14 to 16	₩ ℔, 2.85¢
Nos. 22 to 24	₩ ℔, 3.20¢
No 26	₩ ℔, 3.40¢
No 28	₩ ℔, 3.75¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ ℔ ..5 75¢
No. 26	₩ ℔ ..6.25¢
No. 28	₩ ℔ ..7 25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24	₩ 100 sq. ft. $3.80	4.75
No. 26	₩ 100 sq. ft. 2.90	3.95
No. 28	₩ 100 sq. ft. 2.55	3.70

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal; IC, 14 x 20	$6.15
IX, 14 x 20	7.40
A. Charcoal; IC, 14 x 20	$5.20
IX, 14 x 20	6.30

American Coke Plates—Bessemer-

IC, 14 x 20 ..... 107 ℔	$4.20
IX, 14 x 20	5.20

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 10
IX, 20 x 28 with an 8 lb. coating	10.00

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 20¾¢ ₩ ℔

High Brass Rods—

List August 1, 1908. 14¾¢ ₩ ℔

Roll and Sheet Brass—

List August 1, 1908. 14¾¢ ₩ ℔

Brass Wire—

List August 1, 1908. 14¾ ₩ ℔

Copper Wire—

Base Price. Carload lots m'l 15¢

METALS—

Tin—

Straits Pig ..... ₩ ℔ 37¼@38 ¢

Copper—

Lake Ingot	₩ ℔ 14½@14¾¢
Electrolytic	₩ ℔ 14½@15 ¢
Casting	₩ ℔ 14 @14½¢

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ ℔ 17 ¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot

Planished Copper, 1¢ ₩ square foot more than Polished.

Spelter—

Western ..... ₩ ℔ 6 @6¼¢

Zinc.

No 9, base, casks ..... ₩ ℔ 8¢ | Open ..... ₩ ℔ 8¼¢

Lead.

American Pig	₩ ℔ 5¼@5½¢
Bar	₩ ℔ 6¼@6¼¢

Solder.

½ & ½, guaranteed	₩ ℔ 20 @20½¢
No. 1	₩ ℔ 17½@17¾¢
Refined	₩ ℔ 15½@15¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ ..@10¢
Hallett's	@9½¢
Other Brands	@9 ¢

Bismuth—

Per. ℔ $2.00@$2.25

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢

Rods & Wire	Base Price 33¢
Sheets	Base Price 34¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents ₩ ℔
Copper, Heavy cut and crucible	11.25@11.50
Copper, Heavy and Wire	10.75@11.00
Copper, Light and Bottoms	9.75@10.00
Brass, Heavy	7.50@ 7 75
Brass, Light	6.00@ 6 25
Heavy Machine Composition	10 00@10.25
Clean Brass Turnings	7.00@ 7.25
Composition Turnings	8.00@ 8.25
Lead, Heavy	....@ 3.75
Lead Tea	....@ 3.50
Zinc Scrap	....@ 3.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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